

• **Hands-On: Affordable Home Theater Speakers** •

VIDEO

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magazine

LCD Camcorder Face Off

**We Compare
5 Unique Big-
Screen Shooting
Machines**

**THE CASE FOR
FRONT PROJECTORS**

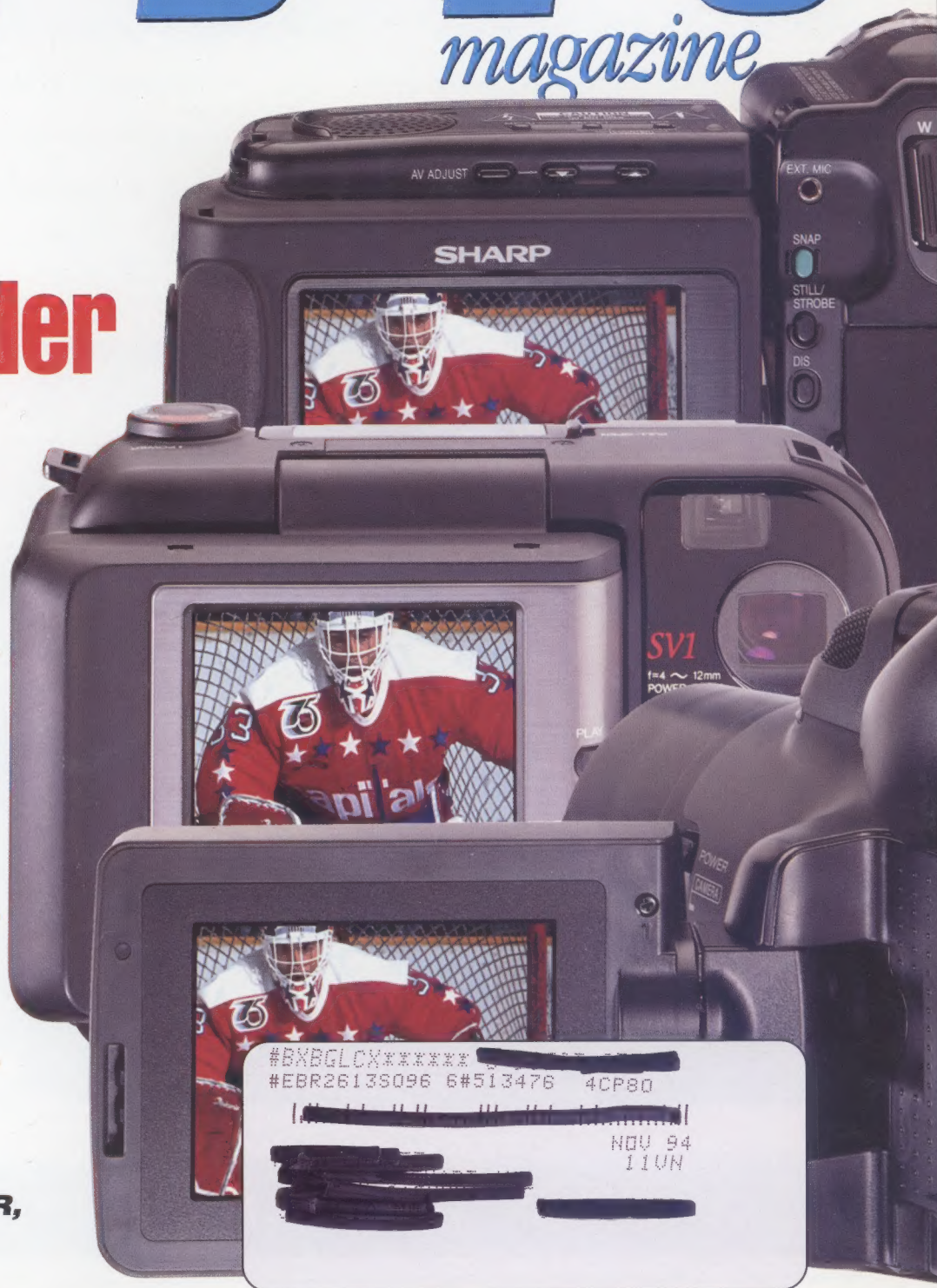
**S-VHS VCR
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5 VIDEOTESTS

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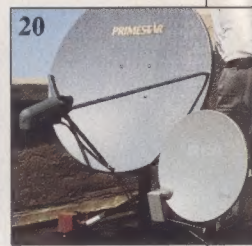
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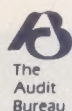
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LCD camcorders (from top) include Sharp's Hi8 VL-H400U ViewCam, JVC's VHS-C System-Max and Sony's 8mm CCD-FX730V. Photograph by Dan Wagner, goalie: Craig Melvin, Sports Photo Masters, Inc.

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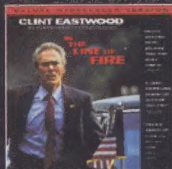
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An American Legend	* 1246404
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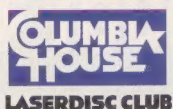
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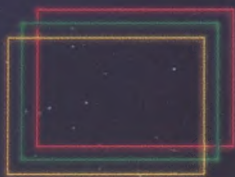
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CHANNEL ONE



Your right to copy under attack?

The first sale doctrine is the hard-won principle that protects your right to buy and use VCRs to make tapes at home for personal use. It was settled by the Sony Betamax case in the mid-'80s, and has survived many an effort to do away with it. It may have to withstand another, this time from a Commerce Dept. project to update copyright laws for the digital '90s. A draft paper from the Information Infrastructure Task Force recommends redefining digital transmission as a type of distribution, like publishing, that should be controlled by copyright owners. The first sale doctrine, the group says, "should not apply" to these transmissions. Going further, the group would ban all products or components that defeat copy-protection codes. Want to make a videotape of that movie you may someday download over the Internet? Forget it. Want to save a copy of that Letterman-Madonna rematch your digital satellite dish picked up? Never mind.

The Home Rights Recording Coalition, which represents manufacturers and some consumer groups, says such rules would effectively rescind "existing consumer rights" dealing with first sale and fair use, since "Fair use is an empty right in the absence of a product to use." In fact, the rules would appear to back consumers into a corner where any version of a digital program they might make would be legally suspect. The task force's work will be the basis for much debate in Washington. But its ideas serve copyright owners at the expense of consumers. Before they harden into statutes, they need to be reworked to protect explicitly the rights consumers have established over the years to use the movies and programs they buy or receive. It would be a shame to hobble with restrictions technologies that should expand everyone's opportunities.

This month's issue includes illuminating looks at big mini-screens and compact big-screens. The former are the LCD monitors affixed to the new camcorders pioneered by Sharp, Sony and JVC. Timothy Liebe's "LCD Camcorder Face-Off" shows how they're changing the way camcorders can be used, as well as the trade-offs you'll encounter. The big screens belong to front projectors, a sophisticated class of imagers that videophiles shouldn't automatically discount as too costly or complex. Brent Butterworth's "The Case for Front Projection" shows why. You'll also find our promised follow-up to last month's cover story about small-dish satellite systems. We set up PrimeStar's 36-inch dish and digital receiver, chief competitor to the Digital Satellite System that carries DirecTv and USSB programs, and clicked it on. To see how it fared, turn to our "Hands-On Test."

This month's pages are also our first produced completely on disc, thanks to powerful new computers we'll also be using to sharpen our presentation of each month's video news. A tip of the hat to Art Director Marshall Moseley for a skillful transition.

Stan Pinkwas

Stan Pinkwas
Editor

VIDEO

magazine

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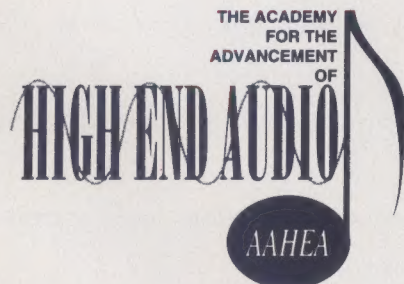
HEAR THE FUTURE TODAY

The high-end audio industry has always been dedicated to the reproduction of music exactly as it was recorded. A good high-end music system provides amazingly accurate and lifelike re-creation of the musical experience in the home.

Regular readers of *VIDEO Magazine* need no introduction to the fact that the marriage of audio and video is upon us and is creating tremendous interest in home theater. This phenomenon has spawned considerable debate as to the qualitative differences between good home theater sound and good "old fashioned" stereo. Many audiophiles, it seems, believe that home theater sound and music reproduction are somehow incompatible, and often appear all too eager to relegate home theater to underserved "mid-fi" status.

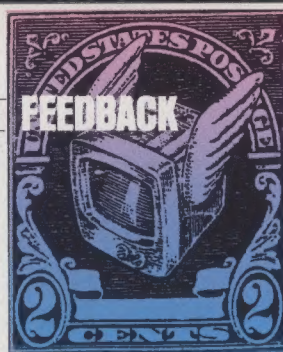
As I see it, the enjoyment of both movies and music is achieved by the best possible sound, period. The high-end system of the future will likely incorporate more than two channels, video, and the dynamic capability to reproduce both music sources and movie soundtracks. The best audio components make all that possible today. Enjoy!

**Chris Browder, B&W Loudspeakers,
President of AAHEA**



This column is presented by The Academy for the Advancement of High End Audio (AAHEA), an organization dedicated to the recognition of excellence and the promotion of greater awareness of high end audio.

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Letters from our readers

Dissing DBS

Your article on the information super-highway ("Hope, Hype and Reality," Aug.) incorrectly states that the new DBS systems will offer the first "true alternative" to cable. Conventional home satellite systems have been around for more than a decade. These systems can pick up more satellites, and DSS is not the first system to offer digital stereo surround on HBO, TNT and MTV. Moreover, the cost of programming is more expensive on DBS. Nothing's free and you have to take packages whether you want them or not. The smaller dish will only benefit apartment dwellers. Dan Schillinger
Rapid City, South Dakota

Good as Gold

Thanks for the thorough review on the MSB Gold LS-1 Transport ("Video-tests," July). I would like, however, to clarify a few points. The Gold LS-1 is not built on the LX-900 chassis, but on one in the same line. The Gold PS-1 Processor has only one RCA S/PDIF digital input at the \$3,395 price. The Triple Input Option, for \$440, adds a second RCA digital input and an AT&T optical input. We built the LS-1 primarily as a high-end audio transport to compete with the finest CD-only transports. We design our products to be as accurate as possible, and trust this makes their performance easy to predict and utilize fully in every system.

John Turkel, Sales Manager
M.S.B. Technology Corp.
Moss Beach, California

Limited patience

I recently purchased the VHS version of the limited edition *Terminator* films for \$49.99. The following week, the same store had the special expanded edition of *Terminator 2: Judgement Day* in widescreen or pan-and-scan for \$24.99. Had the salesman informed me of the new arrival, I would have put off my purchase. These kinds of choices are not choices at all. When will intelligence, instead of just greed, rule the way films are released and distributed?

Josmar Lopes
Bronx, New York

The Chung factor

I look forward to each issue of *Video Magazine* knowing I'll learn something new and useful regarding home theater. But no article has served me better than Corey Greenberg's "Home Theater" (Sept.) about setting surround sound levels. After spending thousands on home theater equipment, I took his advice and plunked down another \$32 for an SPL meter to balance my speaker levels. What a difference it made! Thanks to Corey, I now have a system that exceeds anything I hoped for. I also took his advice and used Connie Chung's voice to set my subwoofer level. How did Corey know her voice would be perfect for this procedure?

Rob Mayer
Milwaukee, Wisconsin



For the record

The correct name of the company, noted in September's "Late News," that's selling HDTV VCRs in the U.S. is Captain New York. Prices for the VCRs, which play base-band, not MUSE, HDTV signals, have yet to be announced.

June's "Home Theater" misidentified the filter that comes with the Reference Recording laserdisc *A Video Standard*. It's a custom-made deep blue filter similar to Eastman Kodak's Wratten 50.

Send letters to *Feedback*, *Video Magazine*, 460 West 34 Street, New York, NY 10001; or fax to 212-947-6727 after 5 p.m., EST, weekdays, or all day on weekends; or send messages via CompuServe to 75147,1255. Letters may be edited for clarity and space.



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ELECTRONICS

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More movies on Video CD

▶▶ Bond's back, in Video CD this time, as part of the growing library of films in the new small-disc format. Philips Media is releasing 16 James Bond films, including half a dozen not available in VHS, for \$24.95 each. The titles include *You Only Live Twice* and *A View to a Kill* this month and *Moonraker* in December. Philips' other new Video CD movies include *Wayne's World*, *Silence of the Lambs* and *A Fish Called Wanda*. The discs are playable on CD-i players with MPEG Digital Video cartridges.

Meanwhile, Image Entertainment, the country's largest laserdisc distributor, is jumping in this fall with four CD-ROM titles a month, including *The Terminator*, *Robocop* and *Dances with Wolves*. Most films will come in two-disc sets since each Video CD only contains about 72 minutes of video.

THE NUMBER

25,000

Hours of movie and TV shows to which closed captions are added each year to benefit the deaf and hard of hearing.

Rating videogames

▶▶ Videogames like movies are getting their own industry-devised ratings, and a five-level system by the Interactive Digital Software Association is the likeliest candidate for widespread use. The ratings will include phrases about each game's content. The categories, divided by age group are:

- Adults only
- Mature (age 17 and up)
- Teen (13 and up)
- Kids to Adult (6 and up)
- Early Childhood (3 and up)

PEACE, LOVE & MULTIMEDIA



Rundgren at Woodstock

▶▶ Saugerties, New York. Mud may have provided the essential experience for the 300,000 brave souls who attended Woodstock '94, but those savvy enough to venture behind the main concert area found a glimpse of the pristine, digital world of multimedia. In a six-acre area dubbed Surreal Field, Philips, Apple and several other forward-looking companies wowed the weary crowds with hands-on exhibits of the latest interactive technology. Philips ruled Surreal Field with one of the most elaborate multimedia displays we've ever seen. Each morning, festival goers lined up beneath a giant dinosaur with outmoded electronics—eight-track tape players and the like—hanging from its four-story skeleton. A looped voice whispered, "Be bold. Don't get frozen in the past. Step into the future." The dinosaur led to a theater where an introduction to CD-i played on dozens of monitors and two huge projection screens. After the film, media-nauts could settle in among 90 CD-i play stations in a nearby tent.

Philips' most enticing attraction was rock musician and techno wiz Todd Rundgren. Rundgren performed five times each day throughout the festival in his "Todd Pod," a compact interactive stage set that looked like an open-air Apollo capsule. The Todd Pod, inspired by Rundgren's award-winning CD-i *No World Order*, let audience members actually participate in the spontaneous creation of music. Video cameras lowered into the crowd during the performance fed real-time images to monitors mounted across the top of the Pod.

In Apple's Multimedia Midway, Woodstockers tried out the hottest CD-ROMs, from *A Hard Day's Night* to *Myst*. And watched as a team of producers put together daily editions of a multimedia newspaper that was shown to the festival audience on monitors flanking the main stage. The *Woodstock '94 Nation News* was produced on 15 Mac-based workstations using Radius VideoVision hardware, Adobe Photoshop and Premiere, and Macromedia Director.

Other Surreal Field highlights were Peter Gabriel's *Mindblender*; a motion simulator based on the musician's Kiss *That Frog* music video; and *Beyond 3-D*, billed as the first 3-D action sports movie. If this year's event is any indication, Woodstock III in 1999 should be interesting indeed. —Ken Korman



QUOTE OF THE MONTH

The cinema's cultural bite is more dangerous than any tank and mines.

— MAHMOOD MOHAMMADI-ARAQI, head of Iran's Islamic Propagation Organization, warning against the influence of Western TV shows being beamed by satellite into Iranian homes

The Paper's papa

►► The man behind *The Paper*, the ensemble comedy about a day in the life of a New York City tabloid, knows something about ensembles: Six-year-old Ronny Howard became famous as Opie, part of the wacky ensemble on TV's *The Andy Griffith Show*.

"I like ensembles" says director Ron Howard, 40. "The actors on the Griffith show were just a lot of fun to be around, a silly group, joking all the time. But they were able to stop on a dime and really focus. They carried that playfulness onto the screen."

Howard has had his share of ensemble hits (*Parenthood*, *Cocoon*), but it didn't come easy. Before directing his star-making blockbuster *Splash*, the former star of *Happy Days* had a rough time. "There was a great deal of resistance. But from the time I was eight or nine, I only wanted that job."

Howard persevered—"I kept bugging George Lucas for tips"—and now, claiming to have never lost money for a studio, the still boyish-looking (but-balding) director has only one regret about his previous career as an actor: typecasting.

"You know, no matter what I do or say, I'll always be Opie," he observes. "I once told some newspaper editors, Look, guys, do me a favor. If I'm ever killed in a plane crash, can you please not write, Opie Bites It?" They all agreed, but one called me back and said, Look, Ron, I can't make that kind of promise. It's just too good a headline."
—Tom Soter

Video avenger

►► Personal video doesn't get much more personal than the flamboyant bodycam fashion designer Jean-Paul Gaultier created for the tabloid TV journalist Andrea Scarface in *Kika*, a take-no-prisoners comedy by Pedro Almodovar. Cabled like a cyborg, Andrea prowls through the film as the embodiment of trash TV, ferociously searching for news to capture live. Gaultier's outfit features a swiveling video camera bolted to Andrea's helmet, video lights at her breasts, camera and mic controls on her hands and arms, and a technician's toolbelt at her waist. *Kika* 's not on tape yet, but when it is, check it out.

—Stan Pinkwas



Bounty mounties

►► The Motion Picture Association of America is offering a unique bounty—\$2,500 to the first person to finger a pirate video lab that produces illegal video dupes. The lab must have at least 30 VCRs, and the tip must lead to arrests or the seizure of equipment, although not to a conviction. Info about video piracy that results in convictions may qualify you for another MPAA program with rewards up to \$15,000. The MPAA anti-piracy hotline is 800-NO-COPYS.

TIMESHIFT TEN YEARS AGO IN VIDEO MAGAZINE

"Steven Adkins was receiving Indianapolis microwave distributor TVQ's signal with an antenna he made from a Maxwell House coffee can and \$30 worth of plastic sewer pipe and assorted hardware. Recently a judge found him guilty of signal piracy...The 300 PBS affiliates nationwide are hoping to broadcast entirely in stereo within the year. They may become the first network to do so, according to Senior Vice President Eric Sass. All they



NOVEMBER 1984

need is money—equipment conversion is expected to cost about about \$30 million...No more need to worry that you'll accidentally bring home a scandalous X-rated cassette when you really wanted wholesome PG fare—or the other way around. The Motion Picture Association of America and the Video Software Dealers of America have agreed to display standard movie code ratings (G, PG, PG-13, R, and X) on all films released on cassette and disc...The new 19-inch Magnavox TV includes a high resolution filter to allow it to deliver a whopping 330 lines of horizontal resolution...If the right title comes along, we might just see the first \$19.95 videocassette in the coming year...The top five videodiscs on the sales chart this month are, in order, *Terms of Endearment*, *The Right Stuff*, *Silkwood*, *Gorky Park* and *Scarface*. ■

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Late Breaking News

RCA that was the subject of last month's cover story ("Dawn of the Small Dish"), is jumping off shelves. Sales at presstime were expected to top 100,000, and that was before the national rollout had hit its stride.

DISNEY STUDIOS, WHICH HAD refrained from clambering onto the video superhighway, has announced plans to develop interactive projects with BellSouth, Ameritech and Southwestern Bell. Home-shopping, movies-on-demand, traditional TV shows, games and an advanced program navigation system are all possible products. "Our goal is to use technological breakthroughs and new entertainment delivery systems to provide customers with a compelling and creative array of programming," said Disney CEO Michael Eisner.

3DO HAS SELECTED A KEY technology for its next generation of game machines, while Matsushita, the only company selling 3DO players in the U.S., has cut the price of its current model by 20 percent. The drop lowers the suggested price of the REAL 3DO multiplayer to \$399, making it more competitive with other game systems. 3DO's new technology is the Power PC chip, developed by Motorola, Apple and IBM, and used in this year's powerful new Apple and IBM computers. 3DO will use the chip for its 64-bit system, which is due late next year, and to make possible such new system peripherals as a modem, a keyboard and a mouse.

A GROUP OF KOREAN AND Russian companies says it has developed a "diamond-like" carbon coating that can triple the working life of VCR head drums over the titanium coating typically used today. Daewoo, which financed most of the three-year research effort, has already introduced a VCR in Korea that uses the coating and plans to apply it to all its models.

PACIFIC TELESIS, THE BIG WEST Coast Baby Bell, is scotching plans for

THOMSON Consumer Electronics seems to have itself a hit. The Digital Satellite System, consisting of the 18-inch-dish and receiver made by

a trial run of its interactive video network to 1,000 homes in Milpitas, California. The telco is going all out and will simply build its proposed \$16 billion system without the test. The company hopes to wire the whole state for interaction by 2005.

MEANWHILE IN ANOTHER lane of the info highway, Southwestern Bell intends to offer phone services over a cable TV system it owns in Montgomery County, Maryland. Subscribers will be able to buy cable and phone services, cable services only or phone services only. The plan, which includes advanced phone features like voice mail and caller-ID, could start as early as next fall.

HITACHI HAS DEMONSTRATED a tiny, digital camcorder that can shoot color video using a memory storage chip instead of tape. The industry-watching Television Digest reports Hitachi showed a prototype

Hitachi prototype for a solid-state camcorder.



for the solid-state shooter at a Japanese trade show recently, and said a production model could be ready by 1999. It would use a 400-megabyte flash memory chip the size of a sugar cube to record 30 minutes of video at less than VHS quality. Because the camcorder has no moving parts, it weighs a mere 10 ounces.

DEVELOPERS ARE CHASING A new rainbow—machines that can play CD-ROMS directly to television sets. Microsoft is working on one, and Macromedia, the San Francisco software company that created the Director authoring program, recently teamed up with Microware to create a digital audio/video interactive decoder they'll call DAVID. DAVID will be able to translate CD-ROM material into NTSC. It's likely to turn up first in tests of interactive systems by phone and cable companies. But the ultimate goal is a home product, costing a few hundred dollars, that ordinary entertainment junkies will want to afford.

Laserdiscs online

►► Where can you go to find a vast selection of laserdiscs 24 hours a day, seven days a week? How about your home computer? You can search services such as CompuServe and America Online, where you'll find lists of available and upcoming discs, sometimes sorted by such factors as "letterboxed only" or "THX releases." But there's also a BBS (bulletin board system) dedicated entirely to laserdiscs—Sight and Sound's LaserNet BBS (617-894-8633).

Although the interface is a bit clumsy, just follow the manual and you can get information on the store's vast inventory of new and used laserdiscs, or chat about your favorite discs with fellow enthusiasts. You can search for a specific title, then e-mail your order; or download lists sorted by a wide variety of categories including Criterion, discounts and imports. The used disc inventory is updated daily, which gives you a better chance of finding the listed titles in stock. The Laserbolt section carries exciting information about upcoming releases, including details about the extras you might find on a disc. For a \$10 sign-up fee, which can be used for credit toward a disc purchase, you get an access account and a 42-page instruction booklet. You can use any computer with a modem (speeds up to 14,400 bps) and most communications programs.

—Larry White



25 and counting

►► Attention collectors: Sony is celebrating the 25th anniversary of its Trinitron color television technology with this silver bullet. The KV-25th, with a five-inch screen, has been created in an edition of 2,500 priced at \$699 each. As befits a limited edition, each TV will be individually numbered, accompanied by a certificate of authenticity and fitted with silver-plated controls. —Stewart Applegath

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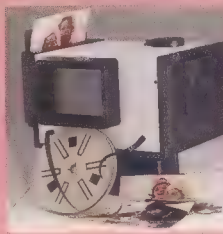
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◀ AUSTRALIAN BEAUTY

Duntech's PCL25 loud-speaker (\$1,995/pair) is a two-way, three-driver speaker that has been time-aligned. Duntech says this produces excellent stereo imaging, high levels of neutrality and a more natural sound. The star-shaped tweeter aperture, along with layers of blue felt, is intended to absorb and dissipate early reflections. These speakers are finished in wide-grain Brazilian rosewood, Australian jarrah or burled walnut. (For additional info, circle 109 on the Reader Service Card)



FISHER'S HOME SYSTEM ▲

Fisher's top-of-line 9435 A/V system (\$1,299) blends different components into a home system. The ensemble includes a 100-watt Dolby Pro-Logic amplifier, a 40-channel random preset tuner, a double-cassette deck and ■ 24-CD management system housed in an oak or black woodgrain-finished cabinet designed to accommodate an optional TV and VCR. A unified audio-video remote control operates most system functions, as well as Fisher VCRs and TVs. (For additional info, circle 100 on the Reader Service Card)

VIDEO SNAPS ▶

Fuji's Fujix Photo-Video Imager FV-7 (\$995) is a viewer that allows users to examine 35 mm negatives slides and photographic prints on a TV screen. The FV-7 can serve as an input device for editing, publishing or database storage. Color images can be switched to black and white and negatives can be converted into positives. (For additional info, circle 104 on the Reader Service Card)



SLIM BIG-SCREEN ▼

Sony says its new 53-inch KP-53XBR35 TV (\$4,099) is its first big-screen set to incorporate a new, high-contrast screen. The dark tint improves contrast and intensifies the black level, which Sony claims makes colors brighter and more vivid. Sony has kept the package to a slim 25 inches in depth. Digital sound processing lets viewers mimic different audio environments, such as ■ movie theater or concert hall. (For additional info, circle 101 on the Reader Service Card)



◀ PREMIERE EDITING

Adobe Systems Premiere 4.0 for Windows adds new features for video enthusiasts. The program delivers titling, motion control, and an expanded number of audio and video tracks, as well as pro-level features like timecode support and field processing, a new Trimming Window, improved previews and support for edit decision lists. Users can now control video equipment via V-LAN and ARTI networks. The price is \$495; \$129 for upgrades. (For additional info, circle 107 on the Reader Service Card)

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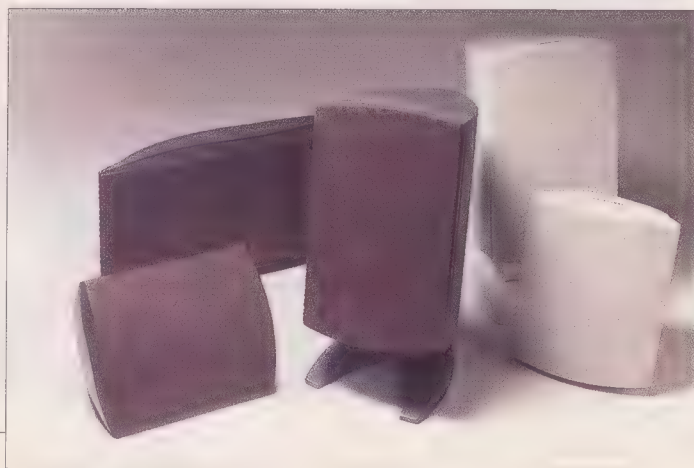
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NEW PRODUCTS



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The Sonance D6000 In-Wall speaker may be the most adjustable you'll see. Eight treble settings, four mid-range and eight bass settings (controllable by switches on the front baffle) allow 256 adjustments to the output of the tweeter, mid-range and woofer. The aluminum dome tweeter is housed in a pivoting mount, giving owners and installers great latitude in compensating for a particular room's acoustics. The D6000 can handle 100 watts of power with a nominal impedance at 6 ohms. (For additional info, circle 106 on the Reader Service Card)



ZOOM SPECIALIST ▶

Minota's Master 8-812 8mm camcorder is a zoom specialist. In addition to digital signal processing—which controls focus, exposure and color accuracy—and electronic image stabilization, it offers a color LCD viewfinder and an array of zoom possibilities. A 12x optical power zoom, an additional 2x image enlargement and an instant zoom (which enlarges the image another 1.5x) give the 8-812 a maximum zoom range of 35x. (For additional info, circle 105 on the Reader Service Card)

CABLE INDEPENDENT ▼

The Novavision CB 3 5000 Personal Communications Terminal (\$199) by Novaplex (800-644-6682) will turn your TV set into a higher-end viewing system. This cable converter offers easy-to-use onscreen menus, parental lock-out, favorite channel memory, and the ability to watch one channel while recording another. It has connection and expansion options (including an ability to interface with telephones and computers), and can be activated by your local cable operator. (For additional info, circle 102 on the Reader Service Card)



◀ REMOTE CLIP-ON

Insta-Light by Aaction Electronics (908-689-8181) is a reading light for your high-tech gear. It clips onto remote controls or VCRs and is activated by a squeeze-release. For night-crawlers who haven't managed to obtain an illuminated remote, this may be the answer. The price is \$7. (For additional info, circle 103 on the Reader Service Card)

◀ BUDGET SURROUND

Celestion's Style series speakers are designed to provide reasonably priced high-performance surround sound. The Little 1 speakers at \$179/pair (right and left) are two-way units for multimedia, home theater or satellite applications. Center 2 for \$249 (rear) is a high-performance, magnetically-shielded center speaker, while the taller Soundstyle MP1 speakers at \$299/pair (center) are easily mounted bookshelf models that are also magnetically shielded and weather resistant. (For additional info, circle 108 on the Reader Service Card)

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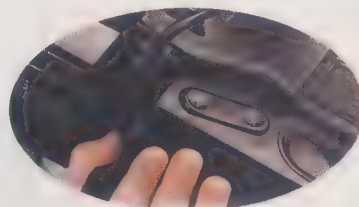


Grandpa used to see
everything in black and white.

The **Color LCD Viewfinder** lets you see life's vibrant colors.



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Primestar gives RCA's DSS tough competition

Primestar Satellite TV System

The big splash RCA is making with its DSS small-dish satellite system has all but swamped another contender: Primestar. Primestar was launched by Primestar Partners (formerly K Prime Partners) a consortium of cable companies. It began transmitting about three years ago, before DSS was even announced.

Until recently, though, Primestar transmitted only analog signals to Ku-band dishes measuring 36 by 39 inches. Digital compression was planned for Primestar from the start, but it began only a couple of months ago, using General Instrument's DigiCipher compression scheme to squeeze 70 channels out of the 20 offered before.

The big difference between Primestar and DSS—outside of Primestar's much larger dish—is the equipment cost. DSS equipment starts at \$700 for a receiver and a dish, but Primestar's arrangement is more like cable TV. Use of the Primestar dish and receiver is included in the subscription fees. Installation costs are comparable to those of DSS—about \$150—but unlike DSS, consumers won't be allowed to install the Primestar dish themselves.

Shortly after completing last month's hands-on test of DSS ("First Look at Small-Dish TV"), we installed a Primestar dish on the terrace of our offices. This is when we noticed the dramatic physical difference between the systems. A DSS dish is so small and light it can be slapped up almost anywhere there's a southern exposure, and your neighbors might not even notice it.

But a Primestar dish requires advance planning—it has to be mounted on something very sturdy. Even though it's smaller than conventional dishes, it's big enough to raise eyebrows in image-conscious neighborhoods, and possibly even attract the attention of zoning authorities.

Primestar Partners says DigiCipher outperforms the MPEG-1 compression

used in DSS. I don't know whether it's because of the larger dish or the different compression scheme, but Primestar definitely suffers from fewer digital artifacts than DSS, at least in this stage of both systems' development.

In last month's issue, I based my evaluation of DSS largely on DirecTV pay-per-view movies, which are carefully encoded in MPEG-1. Since then, I've been watching lots of cable network shows on DSS, which are encoded "on the fly," in real time. I've noticed much more pixelation, mainly during shot

channel. The picture on DSS sometimes takes on a slightly soft-focus look, but that never seems to occur with Primestar. When DSS is performing at its best, its picture is almost identical to that of Primestar. But when DSS is at its worst—when the MPEG-1 encoding's not too good, or when there's lots of movement or many shot changes—Primestar has definite advantages.

With DSS, I experienced "rain fade"—severe digital artifacts and (once) a complete loss of signal—during thunderstorms. Unfortunately, this is one testing condition we can't control: It never rained while we were testing Primestar. But we'll fire up Primestar during the next gully-washer and publish a follow-up ASAP.

I detected a very slight difference between the sound quality of the two systems, but even after considerable switching back and forth, I had a tough time getting a handle on it. DSS seemed marginally smoother-sounding, with somewhat more solid bass. But ultimately, I found the difference was less than what you usually hear between two CD players. It's barely worth mentioning.

Primestar's onscreen menu system is quite clunky compared to the one DSS uses. DSS' menu lets you choose programs by category, and instantly access the program schedule with a dedicated button. And the DSS program schedule carries information for shows up to 24 hours ahead. Unfortunately, Primestar's menu is much more limited,

little more than channel and program identification. It *does* have the Prevue Channel, a cable TV-type program schedule that lets you see the schedule 90 minutes in advance. But in user-friendliness, DSS clearly gets the nod.

Primestar's program offerings are more limited than those on DSS (for channel listings with prices, see the sidebars to last month's "Dawn of a New Dish"). I suspect that most *Video Magazine* readers, who presumably spend most of their TV time watching tapes and laserdiscs, will find plenty enough viewing options either way.

Which system is best? For sheer pic-

RATING: ★★★★★



Dueling Dishes: Primestar's three-foot dish (left) and DSS' 18-inch dish (right) are much smaller than C-band dishes.

changes (particularly dissolves), and when there's lots of movement. The pixels are quite small, and don't usually bother me.

However, on shows with frantic motion, like MTV's *The Grind*, where dozens of dancers are moving and the camera never stays put, the pixelation can be very distracting. In contrast, I noticed almost no pixelation in three nights of watching Primestar, and I had to watch very closely to notice any at all.

Like DSS, Primestar is virtually free of interference, and achieves consistently great reception from channel to

ture quality, Primestar has obvious advantages. But that could change if the DSS service providers (DirecTV and USSB) follow through on their plans to switch to MPEG-2, which offers four times the resolution of MPEG-1. In terms of sound quality, I think they're about equal. Both are a big improvement over broadcast and cable.

All these videophile concerns don't add up to a hill of beans, though, compared to issues of programming, subscription fees, Primestar's larger dish and DSS' relatively high equipment costs. If you *must* have a small dish, you have to spend the bucks for DSS.

If you can deal with Primestar's larger dish and more limited offerings, its quality and considerably lower start-up costs offer definite advantages over DSS. For me, they're both a godsend—either one lets me watch The Cartoon Channel's *Jonny Quest* in my office.

Terk LeapFrog Remote Extender

Since the dawn of consumer electronics, we've been heaped with products and special features that promise added convenience. Usually, though, they deliver only added complexity. But there's one recently introduced product that can be set up in about two minutes, that delivers more convenience than a handful of fancy remotes—Terk's LeapFrog.

The LeapFrog transmitter converts the infrared signals from a remote con-

remote with Velcro; the receiver has a small antenna and plugs into an AC outlet.

The system isn't perfect—it will transmit through walls, but sometimes you have to point the remote in a few different directions to get it to work. I got around this by simply pressing a button and moving the remote a little until what I wanted to happen happened.

LeapFrog is perfect for simple multi-room systems. One nice setup would be

to run wires from an A/V receiver in the living room to an extra set of speakers in the bedroom, then run a video line from the receiver's video output to your bedroom TV, and use LeapFrog with a universal remote. This way, you'd be able to use and control any source component in your living room from your bedroom—a pretty snazzy multi-room system, and all for only \$70 plus the price of a few yards of cable.

—BB



Space Arranger: Terk's Leapfrog remote.

trol to radio signals, and sends them to a receiver that then converts the radio signals back into infrared. This lets you control a component in one room from another room. The battery-powered transmitter attaches to the front of a

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VCC-1

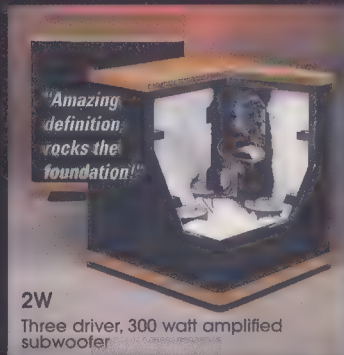
Phase correct center speaker

For almost 20 years, VANDERSTEEN AUDIO has built affordable loudspeakers true to both science and music. If you are looking for speakers that accurately reproduce the entire frequency range and dimensions of the original sound, we can direct you to your nearest carefully selected VANDERSTEEN dealer.

Please write or call for a brochure and name of your nearest dealer.

VANDERSTEEN AUDIO

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2W

Three driver, 300 watt amplified subwoofer

Models available from \$495.

Bose's Lifestyle 12-- surround sound cubed

If you find Bose's satellite speakers too obtrusive, you may have to do without home theater because speakers just don't come much smaller. Bose's swiveling two-cube arrays are part of its first dedicated home theater system, the \$2,200 Lifestyle 12, which includes everything needed for home theater short of video source components. Five of the tiny cube arrays team up with an Acousti-mass bass module that carries amplification for the whole system. Each satellite receives 40 watts, while 80 watts drive the module's two woofers.

The brain of the system is the small, sleek Lifestyle music center, which is finished in simulated brushed aluminum. It holds an AM/FM tuner, a CD player and the VideoStage decoder that takes the place of a Dolby Pro-Logic decoder for processing all programs, be they Dolby encoded or not. A fluorescent display is Lifestyle's only visual; there are no onscreen displays or video switching faculties.

Bose emphasizes set-up simplicity. An integrated cable routes audio and system-control signals from the music center's fixed RCA outputs and system control jack to a DIN input on the bass module. Speaker wires are labeled and/or color coded at each end for left, center, right, and left and right surround duty. RCA plugs make the speaker connections at the bass module. The music center sports inputs for aux, video sound (ostensibly for a TV's audio outputs) and a tape loop. Video switching must be handled by the TV itself, or its owner.

Two pairs of speaker outputs can feed powered speakers, and a second remote can be purchased to control one speaker pair from another room. Like the supplied remote, it's a radio-frequency (RF) design, so it works through walls and cabinet doors. I've never

watched home theater from another room, but let me tell you, it's a joy to poke at a remote that's wedged firmly in the depths of a La-Z-Boy and have it actually deliver. I'd love to see more companies use RF systems. The only problem is that universal infrared remotes are not compatible. If you buy Lifestyle, you'll be slingin' from two hol-

things out, but even when the module was hidden, it made its presence known audibly. I localized on it every time. Here's why: Only sub-bass frequencies are truly nondirectional, and the bass module produces mid- and upper-bass sounds for good reason. Satellites as small as the cubes are physically incapable of producing bass

much lower than about 200 Hertz. The bass module has to reproduce some of these sounds or leave a hole in the frequency response. Happily, there was no hole, although there is a trade-off regarding bass module positioning. If you are anything but a very casual listener, you'll need to put the module near, preferably between, the satellites.

Cute as hell and easier to place than a phone call, the cube arrays measure a scant 3 x 4.8 x 6 inches, weigh two pounds, and come in black or white. The top and bottom cubes pivot, allowing you to cover a wide listening area with the center array or to reflect some left and right sound off the side walls, just like Bose's Direct-Reflecting speakers. The design proved most

effective in surround positions where wide dispersion is desired. I followed Bose's suggestion to mount them on stands in the corners, and found many positions and heights from which to reflect sound off the rear and side walls to excellent effect. I also hung them at different positions on the walls (mounting brackets are not included). Swiveling the speakers to their limit, almost 180 degrees, created a bipolar effect. When mounted high on the wall, the speakers again performed well.

With the treble control down slightly, the system's tonal balance was reasonably flat, if a tad tubby on male vocals. The system lacked authority on

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Gleaming the Cubes: Lifestyle 12 uses tiny speakers, a tuner/CD player/decoder and a subwoofer.

sters, pilgrim.

As with its three-piece speaker systems, Bose claims the bass module can be placed virtually anywhere, including out of sight, because its bass sounds are nondirectional. But I found it difficult to find a place where the module didn't sound boomy. Turning the bass tone control all the way down helped some. Thankfully, the control seemed to reduce the module's overall output (unlike some products in which a boost/cut filter is stuck at an arbitrary bass frequency). This is a smart design. However, the bass still sounded unnatural when reinforced by a corner or a wall. Moving the module to the right of my system near a doorway smoothed

The RCA Home Theatre. It's big. It's bright. It's powerful.

Have we gone too far?



A vast metallic shape looms in front of you. An intense pulsing sound surrounds you. A penetrating light probes your living room searching for intelligent life. You're certain that you'll be whisked away at any moment to an alien world. Relax. Don't worry. It's just the incredible power of the RCA Home Theatre.™ It's where the future of television is taking you. **Changing Entertainment. Again. RCA**

Using a timebase corrector to clean up home videos

Video is based on very precise timing of picture information. As each scan line is swept across the screen, it must stack up perfectly with its predecessors to form an image. If one line should be off by a fraction of a second, the image information will shift slightly to the left or right, creating a minor aberration in the picture. Such timing errors become especially apparent when there's a vertical edge in the shot—when edges of buildings and lampposts look jagged, we know something's wrong.

One of the more obscure technical details that divides the world of professional VCRs from consumer decks is timing stability. Each horizontal scan line is supposed to occur exactly 1/15,750 of a second after the previous scan line. A millionth of a second early or late, and the image distorts. Professional tape formats have better inherent timebase stability, and the VCRs incorporate special circuits called timebase correctors, or TBCs, to clean up the signal even more. (Federal Communications Commission regulations require very close tolerances for the timing of broadcast signals—prior to TBCs, portable video formats could not be legally broadcast, except by optically rescanning the picture with a professional camera.)

A TBC is essentially a memory device. It creates a very slight delay between the arrival of the input video signal and the delivery of the output signal. During this brief interval, the TBC digitizes the incoming video signal, stores the information in memory, and then pumps the information out a fraction of a second later. Because the information coming out of the TBC is being spun out by a digital circuit, not a mechanical tape playback head, its timing is perfectly consistent.

The amount of memory that a TBC has is called the window. When a VCR has a TBC built in, the window is usually equivalent to a few scan lines of the picture—just enough to compensate for slight errors from one scan line to the next. But almost all stand-alone TBCs

have so-called infinite or full-frame windows. The idea is that the TBC has enough memory to store a complete frame of video—525 scan lines.

With a full frame of memory, TBCs can do something remarkable: They can take an asynchronous (out of sync) source, such as a VCR or a camcorder,

special-effects generator (SEG) such as the Video Toaster. Videonics' MX-1 video mixer has an integral timebase corrector.

TBCs used to cost thousands of dollars, and many pro models still do. But as digital memory prices have dropped, so has the cost of TBCs—they're now

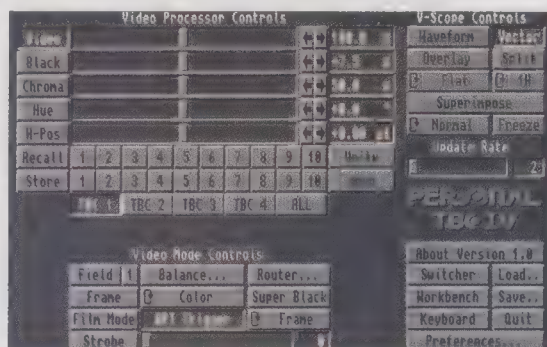
available for less than \$1,000 per channel. (You need two channels for a Video Toaster.) Perhaps the best known of the new crop of low-budget TBCs is the Personal TBC IV, from Digital Processing Systems. This TBC costs less partly because it's a plug-in computer card supplied with software. The costs of building a case, a power supply and a control panel are all eliminated—the computer provides these functions. An optional RC-2000 control panel accessory can provide more traditional control knobs and buttons.

I recently had the opportunity to test a Personal TBC IV. I was curious to see whether passing a video signal through the TBC during ordinary copying—such as occurs in straight-cut video editing, without any special effects—would produce a noticeable difference in picture quality.

Digitizing a signal inevitably degrades it. But if the digitizing system is good enough, the slight degradation will be outweighed by the improvements in timing stability. In technical parlance, the quality of digital conversion, as with audio, is measured by the number of bits recorded in each sample and the frequency of the sampling. The manufacturer says Personal TBC IV has a respectable 58-decibel signal-to-noise ratio, and frequency response to 5.5 megahertz (about 440 lines of horizontal resolution) when the TBC's comb filter is used. Residual timebase error is rated at less than 15 billionths of a second.

The card installs in either an IBM compatible or an Amiga computer. Up to four cards can be installed in a single computer. A single 3.5-inch floppy disk

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Jitter Fixer: The Digital Processing Systems Personal TBC IV is a board (center) that fits in IBM-compatible computers and Amigas. It can be controlled through software (top) or an optional controller box (bottom).

and get it perfectly synchronized with another video device, like a second VCR. This is what's needed when you want to do A/B-roll editing using a

Denon's lifelong philosophy of "Design Integrity" has led us to constantly improve audio quality in all phases of the reproduction chain—including circuitry for Home Theater. As a result, off-the-shelf IC components like those used by our competitors, are no longer good enough for Denon's AVR-2500 Audio/Video Receiver. The new Denon AVR-2500 features Dynamic Discrete Surround Circuitry, **D·D·S·C** which employs discrete surround circuitry plus an 18-bit digital converter in the DSP stage. (Most competitors use lower bit converters.)

DON'T COMPROMISE SOUND FOR SURROUND.

Just as discrete components allow an audio system to be optimized for better sound, Denon's DDSC produces more accurate, more realistic surround sound by reducing Total Harmonic Distortion, by increasing Signal-to-Noise and minimizing DSP quantization noise.

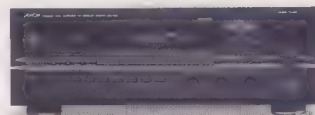
Naturally, the Denon AVR-2500 also features the latest audio and FM circuitry, such as multi-zone capability for playing different programs in different parts of your home and personal memory fields for one-button recall of your favorite, custom tailored surround sound stages. The AVR-2500 and AVR-1500 also feature the RDS *Smart Radio System*, which lets broadcasters offer you additional, invaluable information,



"SMART RADIO"

services and conveniences, either on the front panel or via On-Screen Display on the AVR-2500.

Denon AV Receivers: DSP surround sound, advanced features *and* uncompromised High Fidelity.



AVR-1500

VIDEO ADVERTISER Q&A

Arthur S. Pait, Asst. Marketing Manager for ADDA Technologies Inc., discusses desktop video.

Q Desktop video has been catching on like wildfire over the last few years. How do you account for this?

A The keyword here is "affordable." The need for video production has always been there, the fact that desktop video products are more affordable has made video production possible for those users in either local cable TV stations, community services, schools, corporations, etc. In fact, not only are most of the desktop video products in the market now very affordable, but they also offer better features, ease-of-use, and the same high-quality standards as traditional video products.

Q How would the amateur videographer, say someone with a basic two-VCR editing system, get into desktop at an entry level?

A Most of the time, what they really need is just a simple and affordable combination of a PC and an overlay/genlock board with character generating (CG) and editing software for titling and editing effects. For example, creating a CG station with a 386-40 MHz PC and our award-winning Overlay board (VGA AVer Pro), which comes with professional CG software, will cost them less than \$1300.

Q How advanced can one become with desktop video?

A There is no limit. With products like AVer Video Producer or other desktop video products, you can pretty much do all the things you can do with the traditional video equipment. And remember, instead of spending \$200,000 like it used to be, now you only need to spend \$2000 to \$5000 for desktop video products.

Q&A

RODERICK WOODCOCK

CCD finder, ad killers & auto-play oddities

Q There's a strange mark on the side of my camcorder. It looks like a circle with a straight line through it. There's no mention of it in the instruction manual. What does it mean?

Paul Smith,
Miami, Florida.

A This cryptic looking symbol indicates the exact position of the surface of the CCD pickup inside the camcorder. The surface of the chip corresponds to the film plane in a 35mm or other film camera. Before reflex cameras and other through-the-lens viewfinder systems, the symbol helped determine the correct focusing distance for critical close-up photography. Today it's more a curiosity than anything else, and not all camcorders carry it.

Q I remember seeing ads a few years back for products that claimed to be able to remove commercials from recordings. All you needed was a VCR with remote control. Did the products work, and is anything like them still available?

Brian Sedlak,
Springfield, New Jersey

A Inventing the perfect commercial cutter was once considered to be the Holy Grail of VCR design. That was because originally you could only get a maximum of four hours on a single T-120 tape (the six-hour LP speed appeared in 1979) and the tapes cost up to \$20 each. Longer tapes like the T-160, T-180 and T-200 hadn't been developed, nor had features like high-speed picture search. The video software market was also in its infancy, so people were trying to build their own libraries of commercial-free movies recorded from TV.

Few of these factors exist today. The slowest EP/SLP speed has almost become the standard speed for casual videotaping, and many VCR owners use it for everything they archive. Tapes are cheaper, high-speed search is a standard feature, and just about any movie you want is available on disc or tape for purchase or rental.

Despite this, every now and then another company takes a stab at a commercial cutter. The latest is the Commercial Brake from Arista Technology. It claims to overcome the problem

of knowing precisely where a commercial begins and ends by mapping its position on the tape and compiling a record of the audio and video fades which act as bookmarks for commercials. When you play your recording, these index signals tell the VCR to fast forward through the blocks of commercials. You can watch this happen onscreen, or throw up a blue screen to mask the ads.

Q Your February issue carried a "Tech Tip" ("Skip the Leader") that's not entirely correct. It stated that to avoid dust and dirt accumulating on the plastic leader of a tape, you should fast-forward for a few seconds before pushing the play button. Many VCRs have an auto-play feature that activates if the record tab has been removed from the tape, which is usual with rental tapes. If you then hit the fast forward button, as stated, the VCR will merely scan forward, and the heads won't be protected from dirt. What you should do is insert the tape, press stop, press fast forward, press stop, then press play.

L. Harold Bullis,
Kensington, Maryland

A You're right, the tip is somewhat ambiguous, but the procedure you recommend isn't totally correct either. The situation depends on how the VCR handles the tape. With most older and many newer VHS VCRs, the tape doesn't thread against the heads until you press play. But on newer full-load or "quick-start" VCRs, the tape threads as soon as the cassette is inserted, regardless of whether you select play or the VCR does it for you. Once threaded, some designs will pull the clear leader forward, to ensure that the heads contact the tape and not the more abrasive leader. The bottom line is that there are many variations in the way VCRs operate, even within the same format. Our apologies if this tip confused readers. The procedure remains valid for many VCRs.

Address questions to Q&A, Video Magazine, 460 West 34 Street, New York, NY 10001; fax questions to 212-947-6500 after 5 p.m., EST, weekdays, or all day on weekends; or send questions via Compu-Serve to 75147,1255. Questions may be edited for clarity and space.



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THE ENERGY HOME THEATER
SURROUND SOUND SPEAKER SYSTEM



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The **HITACHI** **VM-E55A** **RATED #1** **BY A LEADING CONSUMER MAGAZINE** **JUST GOT EVEN BETTER!...**

AND HERE'S WHY
To achieve true engineering excellence, a camcorder must combine the most important and popular features with a sleek, attractive, ergonomic design at an affordable price. The engineers at Hitachi faced up to this challenge and were determined to deliver a definitive package at a price of under \$1,000. The result is a true breakthrough — the VM-E58A.

Here's the inside story on how the engineers at Hitachi created this extraordinary camcorder.

1 COLOR LCD VIEWFINDER
The engineers at Hitachi determined through their research that camcorder users desire the accuracy of a color viewfinder. They increased the number of pixels to create a sharp vivid picture that allows you to see what you are shooting exactly as it is. This eliminates the need to keep looking over the viewfinder to check what you are recording.

2 24X ZOOM
Hitachi's engineers have been pioneers in developing longer zoom ranges in order to allow you to get

"closer to the action." This year they have extended the lens to a 12X optical system. Digital zoom further extends the range of the optical zoom system to an incredible 24X, while the instant zoom button magnifies any scene instantly an additional 1.5 times. And even with the more powerful optical lens system Hitachi engineers have been able to keep the minimum illumination requirements at 1 lux. So even in low light situations the VM-E58A will perform flawlessly.

**DIGITAL ELECTRONIC IMAGE
3 STABILIZATION**
Last year Hitachi introduced the first Electronic Image Stabilizer with "angular motion sensors" in the number 1 rated VM-E55A camcorder. This year, Hitachi engineers have improved the system by applying new engineering advancements to make our digital EIS even better. Hitachi's digital EIS can improve picture quality whenever you are walking, riding in an automobile, using high powered zoom or any other activity that causes your camcorder to be unstable.

4 270,000 PIXEL CCD
This extremely dense CCD enabled the engineers to employ an E.I.S. system that does not degrade picture quality when in use. Unlike other E.I.S. systems the engineers at Hitachi developed their CCD so that whether E.I.S. is engaged or not the image remains sharp.

5 ARTIFICIAL INTELLIGENCE
The VM-E58A's autofocus system uses a foolproof through-the-lens approach and its white balance and auto iris are both controlled by a highly-sophisticated artificial intelligence circuit. Its digitally programmed autoexposure system provides perfect pictures with pinpoint accuracy.

The VM-E58A's superlative performance is built into its chips, transport, electronic circuitry and optical system. This is Hitachi — Excellence in Engineering.

*For more information
on the Hitachi VM-E58A,
please call 1-800-HITACHI*



...Introducing the VM-E58A

*"The chips,
the transport,
the electronic
circuitry, and
the optics are
proof of
Hitachi's
excellence in
engineering."*

VIDEO TESTS

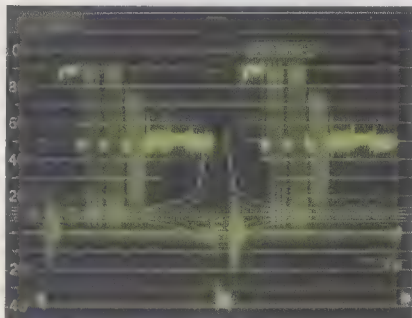


SONY VHS VCR



By Stewart Applegath

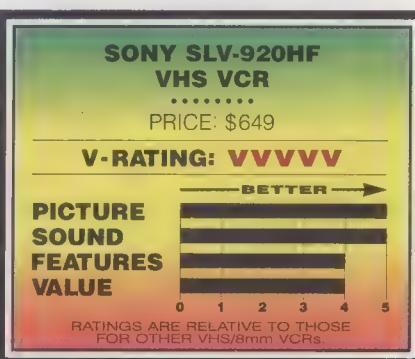
Sony's new top-of-the line SLV-920HF VHS deck arrives with an impressive picture, VCR Plus and some solid editing features for higher-end users, such as a strong audio/video insert capability. Over the years, Sony has refined and simplified its top-end models, paring down the number of features visible while trying to include newer, more useful tools. To



Multiburst pattern for the SLV-920A VCR shows very good video frequency response for VHS.

this day, five years after purchase, I don't quite understand (much less use) all the features on my SLV-757's remote and menu systems. Over time they have become a bit of a visual blur; I simply pick my way through to the ones I use most. It's a relief, relatively speaking, to use the SLV-920HF.

For editing enthusiasts, the SLV-920HF offers a flying erase head (for clean edits without glitches or rainbow patterns), a shuttle dial and bidirection-



al frame advance buttons (for precisely locating the beginning and ending frames of scenes), audio/video insert and a synchro edit function. With the Control S cord/jacks, you can control both VCRs from one VCR, should you have another Sony VCR. Here, we would prefer a LANC connection, or one that would accept other control

systems.

Sony has included a cable box control which allows the VCR to operate most brands of cable box through an included cable "mouse." This little unit connects to the VCR with a cable, sits on top of your converter and issues commands via an infrared control. In this way, the VCR controls channels on the cable box for timer recording. You can also use the remote to change channels whenever the cable box is on.

The SLV-920HF should appeal to home theater buffs. It has stereo sound and can make great dubs from laserdiscs. It includes a number of slow-motion functions that give you the option of scanning through your tapes in different ways.

The VCR Plus feature allows you to record programs using the Plus Code, a number series found in TV guides. Once you punch in a number, the VCR

SPECS AND MEASUREMENTS

Weight & Size (h/w/d): 11.5 lbs., 4 x 17 x 14-7/8 inches

Power Use: 25 watts

Jacks: front—video/stereo audio input; rear—video/stereo audio input and output, RF input and output, Control S, cable box control

Tape Speeds: SP, LP (play only), EP

Video Heads: 4

Cue & Review Search: locking 7x SP, 27x EP; bidirectional shuttle ring 1/5x, 1x, 2x, 7x SP/21x EP

Fast Forward/Rewind Time: less than 4-1/2 min for T-120; less than 3 min. for T-120 in high-speed rewind

Edit Protocol: none

Remote Control: IR wireless with multibrand TV controls

Program Start Locator/Index/Cue: index with auto mark and dedicated buttons for forward and reverse search

Audio: linear mono, hi-fi AFM stereo

Preset Method: auto program plus manual add/erase

Channel Coverage: VHF-2 to 13, UHF-14-69,

CATV-A-8 to A-1, A to W, W+1 to W+84

Timer: 8-event/1-month

Key Features: bidirectional frame advance, bidirectional variable-speed slow motion, speed play, flying erase head, audio dub, video dub, insert edit, VCR Plus with cable box control, 30-second commercial skip, auto clock set/station ID from EDS broadcasts, adaptive picture control

RESULTS

Horizontal Resolution: 240 lines

Picture S/N Ratios (dB): unweighted video 43.9

SP, 41.3 EP; weighted video 49.2 SP, 48.4 EP; chroma AM 46.8 SP, 42.2 EP; chroma PM 44.4 SP, 42.9 EP

Clock/Timer Battery Backup: 3 hours

Audio Frequency Response: hi-fi 20 Hz-5 kHz, +0.06/-3 dB, down -6.2 dB at 20 kHz; linear 100 Hz-10 kHz SP, 100 Hz-3 kHz EP, -3 dB

Hi-Fi Dynamic Range: 82.3 dB

Linear Audio S/N: 43.4 dB

Audio Distortion: hi-fi 0.3%, linear 0.8%



will be set to automatically record the chosen show at the appropriate time. It's a single-step process. The SLV-920HF can also be set to automatically record stereo programs in stereo, with an indicator light

to that effect on the front display panel.

This is the first VCR to include an automatic clock set feature. A time signal is sent out by chosen TV stations on the vertical interval of the broadcast band and is decoded by choosing that particular channel under the automatic setting in the clock set menu. The whole of the U.S. should have access to a local signal by year's end.

With the front panel closed, you can access the shuttle, a high-speed rewind, and stop and pause buttons. To the right of the shuttle knob are record and timer indicator lights. Other functions are displayed in the window—tape speed, sound mode, AV insert and indicators for Sony's Adaptive Picture Control (APC). With the panel open, you have access to the edit on/off switch, input select, channel control and, on the right, APC, quick timer and record.

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HITACHI Hi8 CAMCORDER



By Scott Wasser

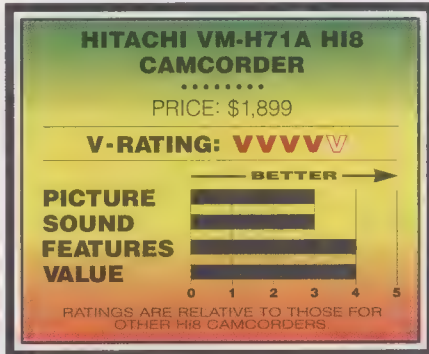
Standing 6-foot-6 and weighing 365 pounds, you'd expect to see him tackling fullbacks or body-slamming professional wrestlers, not toying with a tiny camcorder. But who better to test the durability of Hitachi's Hi8 VM-H71A, which is claimed to resist dust, dirt, water and 400 pounds of pressure? After a little urging, my coworker placed one of his size-14 sneakers on the camcorder and balanced his bulky frame. Incredibly, nothing happened. There were no snaps, crackles or pops from overstressed metal and plastic components. My behemoth buddy's jaw dropped when I picked up the camcorder, which had been recording during its ordeal, and showed him it was

still functioning flawlessly.

Later, I put the VM-H71A through more practical tests. Although its performance in almost every respect met or exceeded my expectations, nothing impressed me as much as its initial torture test. I do a lot of videotaping under adverse conditions. These taping ses-



Multiburst pattern for the VM-H71A's recorder section reveals a typical Hi8 frequency response.



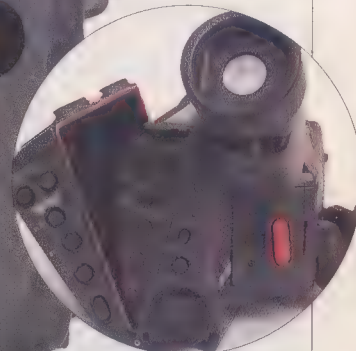
sions are always preceded by long deliberation over whether the results will be worth the risks to which I'll be subjecting my hardware. My camcorders have

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Drip Dry:

Inset shows how shell protects against water and dust.





Matched Set:
The Matchline TV comes with small side speakers that can double as rear surrounds.

PHILIPS 16:9 34-INCH TV

TEST
759

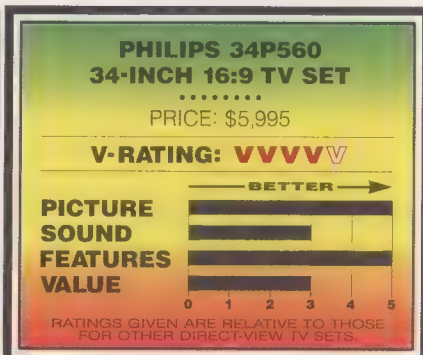
By Kevin Miller

When *Video Magazine* asked me if I'd like to review the Philips Matchline 16:9 direct-view TV, I thought, "Sure! I mean who wouldn't want to get their hands on what's said to be one of the most expensive and sophisticated TVs in the world?" The Matchline is distributed by Philips' professional division, but its tuner and surround sound clearly show it was designed for consumers. At \$6,000, it's the most expensive direct-view consumer set on the market. Is it worth the hefty price tag? We'll see...

The Matchline is a line-doubled set. Its horizontal scan rate is 31.5 kilohertz

(twice the rate of conventional TVs) and the line doubler is non-defeatable. The ProScan and RCA 16:9 sets work the same way. As you'd expect for the price, the Matchline is feature-packed, with picture-in-picture, picture-outside-picture and Dolby Pro-Logic. It also has an RGB input that accepts HDTV and SVGA signals, making it a viable HDTV and computer monitor.

There are five picture-size adjustments. You can watch a regular 4:3 picture with black bands on the sides. If the bands bother you, use the expand mode, which stretches the picture to fill the screen. The drawback is that people look shorter and wider. Or use the panoramic mode, which is better because most of the stretching is at the outer edges so that the correct propor-



tions are kept in the center.

The expand 16:9 mode also uses linear expansion, and is intended for future HDTV broadcasts, electronically "squeezed" 16:9 camcorder tapes and 16:9 NTSC laserdiscs and tapes, which don't really exist yet. The theater 1 mode is designed for use with letterboxed videos; it expands the image to fill the screen without black bars. The last—and probably least useful—mode is theater 2, for extremely wide formats like CinemaScope and Panavision. It fills the screen vertically and horizontally, but crops the sides off the picture.

The keys to getting the most enjoyment and use out of a TV are the remote control and the manual, both of which often impede the consumer's ability to take full advantage of special features. I rate the Matchline's remote control and manual among the best I have encountered. The remote is simple and intuitive to use, yet comprehensive in its functionality. The manual

continued on page 41

SPECS AND MEASUREMENTS

Weight & Size (h/w/d):
200 lbs., 26 x 32-1/4 (not including speakers) x 24-1/4 inches

Power Consumption:
380 watts

Screen Size: 34 inches diagonal

Aspect Ratio: 16:9

Speaker Size: left & right 2-1/2 inches, woofer 5 inches

Preset Method: auto program plus manual

add/delete

Channel Coverage:
VHF-2 to 13, UHF-14 to 69; CATV-A-8 to A-1, A to W, W+1 to W+84

Remote Control: IR wireless multibrand VCR and cable box control

Jacks: front-S-video/video/stereo audio; rear-HDTV/RGB input, S-video/video/stereo audio input, video/stereo audio input and output, variable-level stereo audio output, RF input, line-level subwoofer output, Philips RC5 control (infrared command relay) input and output

External Speaker Connectors: spring-loaded clips for front left and right, rear left and right

Internal Audio Amplifier Power: 5 watts each—front left and right, rear and subwoofer

Key Features: 16:9 aspect ratio with various crop/expand modes, HDTV/RGB input, integral line doubler, picture-in-picture, picture-outside picture, Dolby Pro-Logic

RESULTS

Horizontal Resolution: 560 lines

Picture S/N Ratios (dB): luminance 54.6, video 55.1, chroma AM 63.4, chroma PM 63.1

Screen Brightness: 68.3 footlamberts

Color Temperature: 10,000 Kelvin

Audio Frequency Response: line 20 Hz-20 kHz, +0.5/-0.1 dB; external speaker terminals 150 Hz-20 kHz, +0.1/-3.0 dB, down 14.9 dB at 20 Hz

Audio S/N: 62.4 dB

Total Harmonic Distortion: line 0.2%, speaker 0.6%

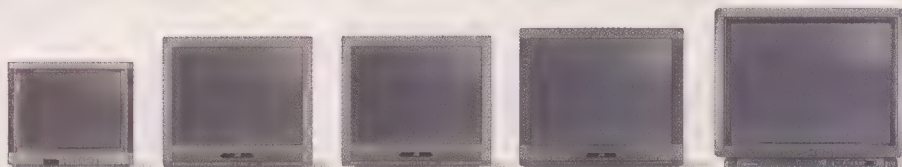
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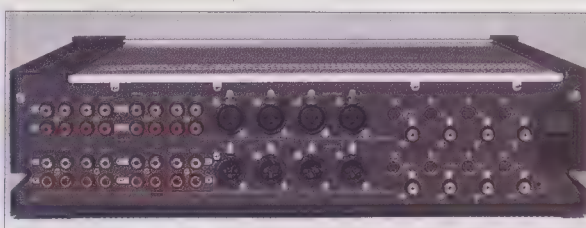
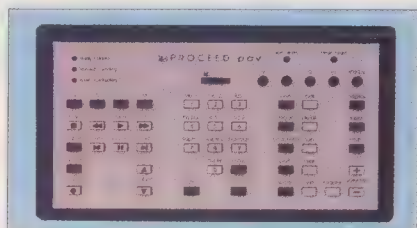
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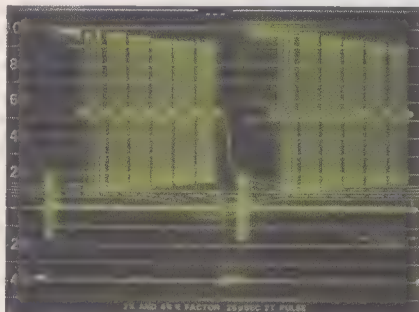
Jack City: The Proceed's elaborate remote control (far left) and rear panel illustrate its flexibility.

PROCEED PAV AUDIO/VIDEO PROCESSOR



By Corey Greenberg

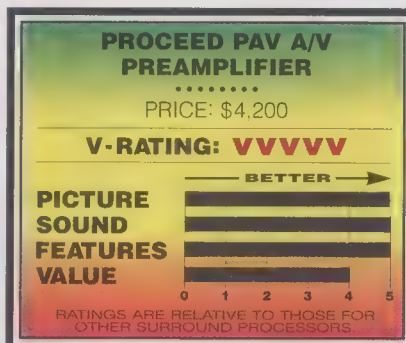
Hardcore audiophiles like to bitch that it's impossible to put together a single system that sounds just as good with music as it does with movies. Me, I don't think it's impossible, but I do think there are a few links in the typical home theater chain that degrade the sound of music compared with a good high-end audio rig. Speakers, for one—if you've got THX or other “video-



Multiburst pattern for the Proceed PAV preamp shows an excellent video frequency response.

optimized” speakers, your system is never going to sound good with music, and that's why I don't recommend them.

Another weak link is the heart of any home theater—the surround processor. Audiophiles have long complained that even the best surround processors on the market offer so-so sound quality at



best when used for stereo music playback. So when high-end manufacturer Madrigal designed its \$4,200 Proceed Audio/Video processor, or PAV, no-compromise music playback was a chief goal.

To call the PAV just another surround processor is selling it way short. The PAV is a full-function system control center that lets you control two

separate audio/video systems from the comfort of your La-Z-Boy, allowing you to choose which audio and video sources get fed to each system. Only the main rig enjoys surround sound, though—the remote system is stereo only. The PAV also performs video switching, with extremely clean circuits.

The PAV performs Dolby Pro-Logic decoding with the good-sounding Analog Devices SSM-2125A decoder chip found in many of the better surround processors. But while most units using this chip add control and audio circuits around it that are mid-fi at best, the PAV marries the SSM-2125A chip with audiophile-grade circuitry and a beefy, precision power supply.

As a THX-certified processor, the PAV offers a THX surround mode in addition to straight Dolby Pro-Logic processing without the so-called

continued on page 42

SPECS AND MEASUREMENTS

Weight & Size (h/w/d): 27 lbs., 4-3/4 x 17-1/4 x 14-1/4 inches

Power Consumption: 40 watts

Remote Control: IR wireless with learning control of VCR, TV, CD player, tape deck, tuner and other components

Jacks: 4 S-video/video/stereo audio inputs,

6 stereo audio inputs (2 balanced XLR), 4 S-video/video/stereo audio outputs (two for VCRs), 2 balanced XLR stereo audio outputs, two stereo audio outputs for audio tape decks; line-level outputs for left and right surround, center channel and subwoofer

Key Features: balanced inputs and outputs, music surround modes, universal remote, multiroom capability

RESULTS

Horizontal Resolution: more than 800 lines, bandpass over 10 MHz

Picture S/N Ratios (dB): unweighted luminance 63.8, weighted luminance 65.1, unweighted video 65.2, weighted video 66, chroma AM over 75, chroma PM 63.3

Audio Frequency Response: main (crossover off)—20 Hz-20 kHz, +0.5/-0.1 dB;

center (crossover off)—20 Hz-20 kHz, +0.5/-0.1 dB

Crossover: high-pass filter—12 dB/octave at 80 Hz; low-pass filter—24 dB/octave at 80 Hz

Max. Output: main—10 Vrms balanced

Audio S/N: main—81.3 dB at 0dB output

Total Harmonic Distortion: main—less than 0.02%

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- **VIDEO MAGAZINE**, January, 1994

*“Deep bass without the aid of big, expensive amplifiers.
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- **SOUND & IMAGE**, Summer, 1993

*“We quickly discovered what a difference the right
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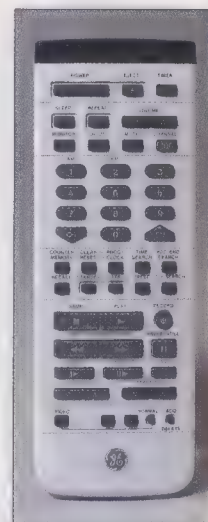
- **SATELLITE ORBIT**, June, 1993



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GE VHS TVCR

TEST
761

By Cliff Roth

As a concept, the TVCR never excited me much. Following the logic of good stereo equipment, where separate components are *de rigueur* for serious hi-fi, the combination TVCR seemed too all-in-one. But what I didn't appreciate, prior to testing the GE 13TVR40 KitchenVision, was that besides the obvious convenience of being able to carry the unit around—compared to schlepping a separate

VCR and 13-inch TV—there are also significant operating conveniences.

For most readers of *Video Magazine*, turning a TV on, determining whether it's set for an antenna or video input, and switching to the appropriate input for the VCR is a simple task. But we've all seen people totally dumbfounded by such an operation, no matter how many times it's explained. For such a person, the TVCR is a blessing.

Pop in a tape and this TVCR automatically turns on and begins playing. Turn it on without a tape inserted, and it automatically comes up as a TV. Say

SPECS AND MEASUREMENTS

Price: \$499

Weight & Size (h/w/d):
28.6 lbs., 15-3/4 x 14-
1/2 x 15-1/8 inches

Power Consumption:
69 watts

Screen Size:
13 inches diagonal

Aspect Ratio: 4:3

Speaker Size: 2-1/2
inches

Preset Method: auto
program plus add/delete
from scan sequence

Channel Coverage:
VHF—2 to 13, UHF—
14 to 69; CATV—A-8 to
A-1, A to W, W+1 to
W+84

Remote Control: IR
wireless with control of
VCR and TV

Jacks: rear RF input,
video/mono audio input

Internal Audio Amplifier
Power: 1 watt

Tape Speeds: SP, LP, EP

Video Heads: 2

Cue & Review Search: 7
x SP, 9 x LP, 27 x SLP

Fast Forward/Rewind
Time: 3-1/2 min. for

T-120

Program Start
Locator/Index/Cue:
hrs:mins. time search

Audio: linear mono

Timer: 4-event/
1-month

Special Features: frame
advance, slow motion,
speed play, commercial
skip on playback, swivel
base, cooking tape
included

RESULTS

Horizontal Resolution:
TV 280-290 lines mono-
chrome, masked by
bleedy color to 250; VCR

240 lines

Picture S/N Ratios (dB):
video 44, chroma AM 44,
chroma
PM 40

Screen Brightness: 70.5
foot-lamberts

Color Temperature:
6,300 kelvins

Accuracy of Colors:
good

Audio Frequency
Response: 100 Hz-15
kHz (speaker)

Audio S/N: 48 dB at
speaker terminals

Total Harmonic
Distortion: 1%

GE 13TVR40 KITCHENVISION 13-INCH VHS TVCR

PRICE: \$499

V-RATING: **VVVVV**

PICTURE
SOUND
FEATURES
VALUE



RATINGS ARE RELATIVE TO THOSE FOR
OTHER DIRECT-VIEW TVs & VHS/8mm VCRs.

goodbye to the old "TV/VCR" remote control button—this unit always knows what it's doing. What makes the GE KitchenVision unique, of course, is its styling—a bright refrigerator-white plastic case, instead of the usual black cabinet. A matching swivel base is included—it attaches securely with four screws. Pictures on the packing box and the instruction manual depict a woman preparing a meal at a kitchen counter while watching a cooking show on her KitchenVision. You'll be able to do the same thing—a VHS cooking tape, *Fancy Chicken Dishes with Jeff Smith* from the Frugal Gourmet series, is also included.

Plug the set in, and a tiny green light under the screen starts flashing, and keeps flashing until you set the time. The TVCR has a minimum number of controls—power, stop and eject, re-

wind, fast forward, play, record plus channel and volume up/down buttons cleverly arranged in a circle. The 51-key remote control makes up for this apparent simplicity. Layout on the remote is good, except that the volume control buttons are small—the same size as the rarely used tracking adjustments.

Convenience features include a time search button that lets you locate any point in a tape by elapsed time, and another button that searches for the next blank spot in a tape to record onto. A poorly labeled "FADV/C.S." button advances the tape by about a minute to skip ads during playback.

The VCR is a basic two-head monaural unit. But with EP tapes, still frame, slow motion and rapid-search picture quality is quite good—the stills are almost free of noise bars. A double-speed playback feature also provides very good EP picture quality; the sound gets muted. However, with higher-quality SP tapes (like prerecorded movies), the picture becomes filled with noise at any speed other than normal play. Tape always stays loaded in the VCR—going from stop to play takes half a second.

Horizontal resolution, when the TVCR was used as a monitor, measured

about 300 lines. In our lab tests we noticed a lot more cross-interference between high-resolution picture material and chroma. Rainbow patterns were apparent wherever the image displayed finely spaced lines, like a tweed jacket. Technical editor Lancelot Braithwaite concluded there's no comb filter in the TV portion, though there is one in the VCR. Screen corners appeared to be slightly rounded.

Audio is loud enough for a kitchen, but not much more. Testing the KitchenVision in my living room, I had to set the volume near the top of the range. (With the volume set to zero, or mute, sound remains slightly audible.) The speaker is at the bottom. It's hardly high fidelity, but did sound slightly more bassy than we expected. Nevertheless, frequencies below about 100 Hertz were inaudible in our laboratory tests.

A channel search feature automatically scans through channels at about one per second. Rabbit ears are provided for VHF. Tuner sensitivity seemed good. An auto-setup programming option locates active stations, but the screen remains confusingly blue during the minute-long procedure. A blue

screen is substituted when the signal falls too low—this feature cannot be disabled (for tuning in very weak stations).

Timer programming capability handles four events. Numbers are entered from the remote control keypad. The one-touch record system offers the desirable ability to delay recording until a later time—up to 11:30 p.m. on the following day. One slight disadvantage of the TVCR, compared with separate units, is that there's only one tuner—so you can't watch one program while recording another. A 30- 60- 90-minute sleep timer is also provided, but there's no headphone jack.

A set of monaural A/V input jacks is on the back, but there are no output jacks. We hooked up a laserdisc player to this video input and found the image reasonably sharp, though we don't recommend a 13-inch screen for letterboxed video viewing!

Overall, the KitchenVision is a good 13-inch TVCR, with unique white styling that does indeed make it more at home in a kitchen than in a bedroom. The sound—not stereo, not hi-fi—is clearly the weakest element here. But for casual TV and tape watching in the kitchen, this will do fine. ■

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Hi8 CAMCORDER

continued from page 31

been dropped in the snow while skiing, been rained on during mountain bike rides and been battered by balls during soccer games. Sometimes they've come through unscathed; other times they've been put on the disabled list. What a relief to finally get my hands on a camcorder designed to withstand punishment.

The VM-H71A will not only withstand the weight of office bullies, it has a water-resistant chassis that will protect it from the elements and even allow it to be submerged up to a foot for up to a minute, according to Hitachi. That doesn't mean the VM-H71A is made for shooting underwater footage, but rather that it won't self-destruct if it happens to get splashed or dropped overboard.

Although it survived several dunkings in the Hudson River by senior editor Brent Butterworth, the only water torture to which I subjected the VM-H71A was a triathlon held in a pouring rain. The rain turned my sneakers into sponges and my shirt and shorts into dishrags, but it didn't affect the VM-H71A.

The camcorder carries a number of features that would make it desirable even if it wasn't the world's most resilient camcorder. The features I found most valuable are its 12x optical-

zoom lens with digital magnification and its electronic image stabilization (EIS). The latter does a surprisingly good job of reducing shakes and jitters, with little of the image lag caused by some stabilization systems. The EIS delivered remarkably stable footage of video shot from a bicycle and from a moving truck. The auto exposure system works so well that using the back-light compensator is seldom necessary. For example, the camcorder gave subjects inside a car just enough exposure to reveal shadow detail without washing out the brightly lit background outside the vehicle.

The auto focusing system also did a good job of honing in on its target, and seemed to have no trouble focusing even in flat light. There's also manual focusing, accessible through a wheel which, unusually, is at the back of the camcorder. Neither its focusing nor exposure capabilities suffer at either extreme of the optical zoom lens.

The color viewfinder delivers a bright image in all types of light. Although it looks much more grainy than the final product, the resolution is good enough for fine focusing.

Press and hold the telephoto button after it gets to the end of the lens' optical range, and the camcorder will digitally zoom in even closer at the expense of image quality. Or press the instant zoom button at any point within the zoom range and the image will be electronically magnified 1.5 times. The overall maximum magnification is 24x. This provides a little longer "reach" when needed, which can be very useful for shooting sports.

SPECS AND MEASUREMENTS

Minimum Focusing Distance: 1.2 inches, wide-angle; 39 inches, telephoto

Focus: TTL auto switchable to knob-type manual

Iris: auto with BLC

Fader: to/from white, vertical curtain to/from black, to/from white with zoom

Shutter Speeds: AE only

White Balance: auto only

Viewfinder: color LCD

Viewfinder Controls: diopter focus

Microphone: stereo electret condenser

Jacks: multipin A/V output, 1/8-inch mic input/edit controller

Tape Speed: SP

Video Heads: 4

Brand/Model: Hitachi VM-H71A

Weight & Size (h/w/d): 2 lbs. without battery or cassette, 4-3/8 x 3-1/2 x 9 inches

Power Use: 7.2 volts DC, 5.8 watts

Image Sensor: 1/3-inch CCD, 470,000 pixels

Lens: f/1.8, 12x (5-60 mm) power zoom with 2x digital magnification and 1.5x instant digital zoom

Filter Diameter: 46mm

Cue & Review Search: 9x forward, 7x reverse

FastForward/Rewind Time: less than 10 minutes for 120-minute tape

Edit Protocol: edit controller remote, compatible with most VCRs

Remote Control: two-card-sized IR wireless with camera, playback and TV controls; wired edit controller with IR emitter for VCR control

Audio: hi-fi AFM stereo

Titles/Graphics: 2 pages with 2 lines of 16 characters

Key Features: water- and impact-resistant chassis, edit controller remote, electronic image stabilizer, insert edit, flying erase head, lithium battery, 16:9 (letterbox) recording

RESULTS

Horizontal Resolution: 370 lines Hi8, 250 lines 8mm

Picture S/N Ratios (dB): unweighted Hi8 luminance 45.4 ME, 43.6 MP; weighted luminance 48.7 ME, 48.2 MP; unweighted video 44.6, weighted video 48.7, chroma AM 41.7, chroma PM 38.3

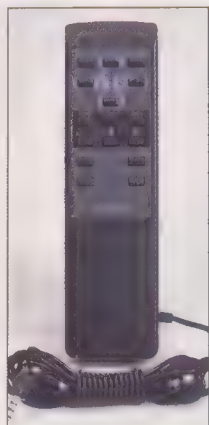
Minimum Illumination: 9.5 lux for 50 IRE approximately

Approx. Battery Life: 52 min. (manual focus/ no zoom)

Audio Frequency Response: 150 Hz-16 KHz, +0.3/-3 dB, -23.9 dB at 20 Hz, -4.3 dB at 20 kHz

Hi-Fi Dynamic Range: 68.5

Audio Distortion: 0.3%



Edit controller remote (left) and regular remote for the Hitachi VM-H71A.

But the VM-H71A has a few limitations when it comes to shooting fast and furious action. For one thing, it doesn't offer user-adjustable shutter speeds. Secondly, the touch-sensitive, two-speed zoom controls aren't especially responsive. The camcorder sometimes takes longer than you'd like to shift into high-speed zoom mode, and it occasionally shifts into that mode when you don't want it to. A self-retracting lens cap would also be welcome, and far more useful to most users than the 16:9 (widescreen ratio) record mode option.

Otherwise, the VM-H71A's ergonomic design and functionality are excellent, with all the important switches and controls simple to operate and within easy reach.

The edit controller remote lets you program the start and endpoints of up to four scenes, and automatically dub them to your VCR. The scenes can even be rearranged in a different order than on the original tape. The procedure is simple—just plug the remote into the VM-H71A's mic jack, then program your VCR's codes into the edit controller remote. Use the transport controls (rewind, fast forward, etc.) on the remote to find the start and end points on the camcorder tape. Forward and reverse buttons on the remote bump the tape about 10 frames ahead or behind for "fine-tuning."

This method of marking scenes isn't that accurate, nor is the controller. With the Zenith VCR we used, we achieved accuracy of about plus or minus 20 frames. Also, the controller may not work with your VCR. Only 15 code sets are listed (Samsung is a noteworthy absence), and even the remote wouldn't work with our Panasonic PV-S4380 VCR.

The picture quality is average for Hi8—with the Sony ME tape we used, it was slightly better than Sony's CCD-TR400—and not quite as good as Canon's ES-1000. But all are pretty close, and all earn a three rating. There was a small amount of luminance noise, the usual amount of color noise, which almost all camcorders produce, and good but not outstanding detail. Still, a serviceable picture will make all but the most demanding videographers happy.

The audio was only fair. The sound through the mic was rather thin, either a result of a so-so mic or the recorder section's weak measured bass response, which falls off below 150 Hertz. There's a watertight cap you put over the mic in wet conditions, which we thought would largely prevent voice recording. But surprisingly, you can still get usable sound with the cap on. Plug in a good external mic, which you can't do in wet conditions (you have to leave one of the waterproof hatches open to use the mic jack), and the sound will get a lot better.

Combine the VM-H71A's functionality with its versatility and durability, and you wind up with a wonderful camcorder that can go places and do things

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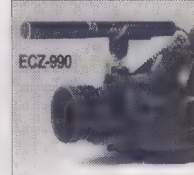
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most others can't—even if the conditions include being crushed by a Killer Kowolski look-alike. ■

VHS VCR

continued from page 31

On the far left are RCA input jacks for Line 2.

APC or Adaptive Picture Control is intended to improve the deck's recording and playback capabilities. It automatically adjusts the VCR to the condition of the video heads and tape, slightly delaying the start of a recording. I tested just how much APC slows down this interval and found it takes about five seconds longer to get up to speed from a full stop with the feature switched on. From stop to record took about eight seconds with APC. Without APC, it took about three seconds. But shifting from pause/record mode to record in APC took only one second. So when you need to get going quickly, you can defeat this startup lag by setting the deck to record/pause mode; the



Sony SLV-920HF remote

APC will analyze the tape and heads while waiting to commence. The rear panel has VHF and UHF connectors for RF (antenna/ cable), the cable box mouse control jack, and a control-S input jack, in addition to a set of RCA audio and video in/out jacks.

The remote control has a lot of features, but I didn't find them difficult to navigate.

The remote includes a shuttle, VCR Plus controls, eject, a high-speed rewind button and still/slow/frame advance functions that facilitate editing. The main playback controls—play, pause, stop, record, volume, channel selector and search buttons—were all within easy reach of my thumb.

I was impressed with the accuracy of the audio/video insert edit function. It was frame-accurate most of the time. There was a slight vertical bob at the in point, but this is normal and it was less pronounced than most of the VCRs we've tested. When the A/V-in point was examined closely, it was clean.

It is not an exaggeration to say that the SLV-920HF is at the top of its class. Technical editor Lancelot Braithwaite felt the SLV-920HF had a much smoother picture than most decks in this category, and was impressed by its steadiness in pause mode. Both Brent Butterworth and myself felt its VHS picture quality was much more pleasing than Panasonic's PV-S4380 S-VHS deck, which we tend to use as a benchmark VCR and which is better than most. Though it has a sharp image, the PV-S4380 seems more grainy and unnatural in VHS mode. The SLV-920HF also has better color—the 4380's color was a bit oversaturated in the film clips we used for A/B testing. Audio reproduction was also very good, virtually indistinguishable from the Panasonic, which we rated as very good to excellent.

The new VCR got me thinking about the trade-in value of my first Sony. The SLV-920HF should outperform most other comparable decks. It is a simple-to-use, cable-friendly VCR that includes some great features and the ability to produce clean, accurate edits with excellent picture and audio. ■

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WIDESCREEN TV

continued from page 32

ability to produce clean, accurate edits with excellent picture and audio reproduction. makes it easy to look up anything you want to learn about.

Using Reference Recordings' *A Video Standard* laserdisc, I set black level (brightness) and white level (contrast), and adjusted the color and tint controls to the correct settings, achieving a much better picture than the set exhibited straight out of the box. The convergence pattern on the disc showed the set was overscanning by approximately five percent, which is excellent for a consumer set. The set includes a flesh correction circuit, which if engaged changes all shades of red to fleshtone. Do not use this circuit if you want the best picture.

As is typical of consumer TVs, the factory presets produce an extremely blue-gray scale. Using a Philips color analyzer, I measured color temperatures between 9,600 and 10,000 degrees



Philips TV remote

the top of the scale to 6,500 degrees Kelvin (the NTSC standard), the middle and bottom were thrown way off. I compromised by setting the top end at 9,200 degrees Kelvin, the middle between 7,400 and 7,800, and the bottom at 8,200. This achieved a closer approximation of correct color. The coarseness of the control adjustments and the unusually high interaction between the controls makes the set

Kelvin from the lowest signal levels to the highest.

The picture looked good at this setting, but I decided to improve it by recalibrating it. As a professional home theater installer, I'm trained and equipped to perform the procedure myself; but it will cost a consumer a couple of hundred dollars.

Unfortunately, I was unable to get a perfect gray scale—when I adjusted

tough to work with. I spent more than a hour on what should have been a 20-minute procedure. Had I spent another couple of hours, I probably could have achieved better calibration, but that couple of hours would be expensive if you're paying a technician.

I watched a Mitsubishi test disc and *Indiana Jones and the Last Crusade*, both of which have plenty of action and motion scenes, to spot motion problems in the line doubler. I was surprised at how good the Matchline's line doubler is—good stand-alone line doublers start at \$3,500. I found it much better than the doubler in the ProScan set, which exhibits motion artifacts and produces a soft picture.

I then compared the Matchline with a calibrated ProScan PS27152 27-inch set used as a color reference at *Video Magazine*. The ProScan trounces the Matchline in brightness; the ProScan still looks good even at high brightness and contrast settings. Properly set up, the Philips set produces only nine footlamberts of light, while the ProScan puts out about 30 footlamberts, the norm for a good direct-view set. (Movie screens usually reflect about 11 footlamberts.) The Matchline should be



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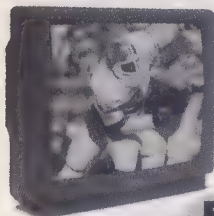
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used in low ambient light to get the most out of it.

The Matchline's tiny, hinged front stereo speakers and five-inch woofer sound tinny and bodiless, among the worst I've heard from a big-screen TV. The surround sound is where the goodies lie. The set has internal amps for rear speakers, with the highly touted PMI/Analog Devices Pro-Logic chip handling decoding duties. I found no fault in the steering, even during *Indiana Jones and the Last Crusade*, a disc with ample surround-sound challenges. The set also has matrix, hall and stadium surround settings. I recommend adding a good multichannel amp, a decent set of speakers and a powered subwoofer, all connected to the set's surround outputs. You'll get high-quality surround sound without a separate decoder. So the speakers probably rate a one; the electronics, a four or five.

Back to my original question: Is this set worth \$6,000? While I don't think it's for everyone, I believe it would be a good choice for anyone with a minimum of space looking to build a quality home theater. It could also be perfect for people with lots of letterboxed laserdiscs. I'm a little disappointed that

I couldn't get it calibrated properly, but given that the picture is pleasing and that it has a good Pro-Logic decoder and can double as a computer monitor, the price no longer strikes me as outrageous, as it did at first. For videophiles living in tight spaces, the Matchline is definitely worth a look. ■

A/V PROCESSOR

continued from page 34

enhancements the THX mode adds. The PAV has several additional surround modes as well, and here Madrigal has wisely avoided the kind of fake reverb and delay-soaked ambience modes so beloved by Cheez-Wiz eaters. The PAV's stereo surround mode derives the left-minus-right signal from the stereo music signal and sends it to the surround speakers—and that's all it does. For purist playback of stereo music recordings, there's a bypass mode that shuts down all the surround circuitry and simply lets the PAV act as a stereo preamp.

The PAV's full-function-and-then-some remote control is unlike any I've seen bundled with a surround processor. Instead of the usual hand-held black wand with a jillion identical black buttons, the PAV's learning remote is more like a small PC keyboard you hold with both hands, with the buttons laid out in logical, two-thumbed positions that make it obvious that Madrigal actually tried this thing before okaying it.

Besides sound quality, the PAV deserves special mention for its incredible ease of setup. This is one area that even the best manufacturers of surround processors haven't addressed nearly as well. The PAV is so easy to set up, I was able to get it running with all the speaker levels perfectly calibrated in under five minutes, without getting up from my seat. With the PAV's onscreen menus and channel level setting from the remote, all you need is a \$32 Radio Shack sound pressure level meter to calibrate your system in no time flat.

The PAV's sound is as good as it gets, and how! It joins that select group of two (ADA's \$3,000 SSD-66THX and Fosgate's \$2,799 Model 3A) in offering the very best sound quality among the many surround processors I've auditioned. Because the PAV is based around the same Analog Devices decoder chip as the ADA, I expected the PAV to share the ADA's ultra-smooth, laid-back sonic character, but the two units couldn't sound less alike. In fact, the PAV sounds a lot more like

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the upfront and gutsy Fosgate than the ADA. The sound of the PAV is dynamic and bold, with an extremely powerful and tight low end and effortless dynamics across the range. While very clean and open, the PAV's highs are a bit more closed in and slightly less detailed than the Fosgate Model 3A when both processors are set for straight Pro-Logic.

But where the PAV really shines is in its lack of grain and grit through the midrange. Well-recorded dialog, like Martin Sheen's spoken voiceovers for the *Apocalypse Now* laserdisc, really showed up the PAV's ultra-clean midrange. The outstanding clarity of the PAV is not subtle compared to the majority of surround processors, even some of the best-regarded units.

Until the PAV, my vote for the best sounding surround processor on the market has been the Fosgate Model 3A. So which processor did I like better? It depended on the situation, because each unit has its own unique set of strengths. When it came to straight Pro-Logic decoding, it was pretty much a toss-up between the two. Switching to THX mode, the race remained neck'n-neck. Only when I switched the Fosgate to its proprietary 70mm surround mode

did I have a clear preference for the 3A over the PAV for movie sound. The 70mm mode is Fosgate's own approach to decoding Dolby Stereo soundtracks, and its faster logic steering and wider-bandwidth surround channel give it a more focused and detailed soundfield, making it my preferred mode when listening to Dolby Stereo-encoded audio from laserdiscs, tapes or broadcasts..

The PAV, however, came out ahead when it came to straight stereo music playback. Even though both processors have a stereo bypass mode, the PAV's sounded cleaner and more natural. The 3A sounds good in straight stereo, but not quite as good as the PAV. If you're building a dedicated home theater and don't plan on using it for critical audiophile music listening, the Fosgate Model 3A—especially in 70mm mode—is still my first choice for a surround processor. But if you want a single audiophile-grade system that's uncompromised when it comes to movie and music sound, my nod goes to the PAV.

I was really knocked out by the PAV. It's obvious a lot of thought went into this product. Madrigal deserves to be proud of its first foray into home theater hardware. At \$4,200, it isn't cheap, but

unlike most audio/video products that cost this much, this time it's worth every penny. ■

TECH TIPS

Save your money

On most modern VCRs, the tape doesn't touch the video heads while rewinding. Don't bother buying a separate videotape rewinder. It's redundant: the VCR can rewind tapes just fine without wearing out the heads.

Andrew Fernandez
La Grange Highlands, Illinois

Remote finders

A good way to find remote controls in the dark is to affix glow-in-the-dark stickers onto them. You can buy these stickers at most craft or department stores.

Matt Shook
Madison, Alabama

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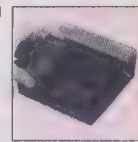
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HOME THEATER

continued from page 22

bass instruments and soundtrack explosions; there was none of the bass that can be felt. The sound of the cubes remained very smooth off axis to the side, but treble diminished rapidly the slightest bit above or below the axis, marring intelligibility. I recommend aiming the satellites at your listening position if they're placed high or low.

As I was listening to the system, I happened upon a passage of tuba music that excited a resonance in the satellites. One note in particular caused the cube array to let out a wail of its own. To make sure it wasn't an isolated problem, I swapped the cube with some of the other satellites, and they, too, howled. I avoided the all-tuba station, and the resonance did not make itself evident otherwise. Detail was good overall.

The remote control selects the source, controls the CD player, adjusts the system and surround volumes, and

chooses the speaker mode from stereo, three-speaker (l/c/r) or full five-speaker options. That's it. There's no test tone and no control over individual speaker levels or delay time. Surround decoding is either on or off. The VideoStage decoder mixes surround-channel sound into the front left and right channels, and the surround level up/down buttons act as a fader, balancing ambience sounds between the front and rear speakers. I found it an effective design.

The surround channel seemed to have more treble than the Pro-Logic system, which rolls off the highs at 7 kHz, making for an improvement in my opinion. VideoStage kept pace with the Pro-Logic on surround-encoded movies. On stereo material, it bested Pro-Logic, which weights the center channel too heavily, and joins the ranks of Fosgate/Audionics, Rotel and Yamaha in providing a subtle surround mode free of unnecessary reverb.

One shortcoming was the way the decoder mixed midrange dialog channel components into the left and right speakers. Bose's motive was to create a phantom center image in midscreen to help anchor the sound of a center speaker above or below the screen. But this is hardly a problem with the direct-view sets for which this system is best suited. Besides, sound/picture discontinuity is more of a problem horizontally than vertically; for viewers sitting off-center, this design tends to draw dialog off the side of the screen. At times, it also gave a wider sound to what should have been hard mono sounds.

I didn't miss independent control of the speaker level or delay, for the most part, but oddly shaped rooms would probably benefit from more control. As usual, the factors that make a system easy to use also make it less flexible. While onscreen display is largely unnecessary in the Lifestyle 12, I would have liked some graphical or numerical indication of the surround-level setting, since formats and programs vary in surround level.

I compared the Lifestyle 12 to my own Pro-Logic system, the main speakers of which cost \$2,000 alone. It was no contest. However, some systems using receivers and bookshelf speakers would also represent tough competition for the same money. For example, five Paradigm Titans, including three shielded models, would total \$530. A similarly powered Yamaha A/V receiver featuring comparable music modes would run \$500 to \$750, and a single-CD player with the programming features the music center lacks would be well under \$200. Three Titans up front, putting out solid bass down to 60 Hz, would probably keep pace with the

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Acoustimass module, and still leave plenty of cash for a subwoofer that really could be placed anywhere.

But Bose has the right idea. It uses five identical speakers that are flexible thanks to the twin-cube design. The VideoStage decoder is an effective, intriguing alternative to Pro-Logic, the RF remote is a winner and all the pieces fit into one 60-pound box. Even the bookshelf-sized Titans would be too big and black for some. And for them, Bose's Lifestyle 12 home theater system might be just the ticket. ■

CAMCORNER

continued from page 24

contains software for both IBM and Amiga computers. I installed the Amiga version, almost without a hitch. The one thing I foolishly overlooked, although the instructions make it quite clear, is that besides plugging into the computer slot, the board must also be connected to the computer's serial port. The entire installation took less than an hour.

Once installed, the control screen is quite intuitive, at least for anyone who has been around video signals for a while. Besides affecting the signal's timing, the TBC also provides a host of so-called "proc amp" controls. (These get their name from the analog processing amplifier, which existed in broadcast video for many years before the digital revolution.) There are slider adjustments for video level, chroma saturation, etc. For color correction, an excellent three-axis graph with red, green and blue vectors pops up on the screen. You can move the pointer from the center and observe the tint changes on the output.

You can store 10 sets of picture adjustments in memory for instant recall. Suppose you're editing a dialog between two people, cutting between two different close-up shots and a wide shot, and each needs its own set of adjustments. As you edit, you can instantly jump to the settings needed for each.

The card has both S-video and composite video inputs and outputs. An "advanced sync" output connection is provided for use with industrial editing VCRs costing upwards of \$2,500. The only sacrifice you make using the TBC with a VCR that does not have an advance sync input is that there's a greater likelihood that the TBC will occasionally need to skip a frame, sub-

stituting a portion of a frame stored in memory, to "catch up" with the tape. A genlock input allows the TBC to synchronize with another TBC (as needed for A/B-roll editing), or any other video source.

MULTIGENERATION TESTING

Sure, it's fun to play around with color correction, but what about when you're editing good video that was properly exposed, and doesn't need any par-

ticular adjustment? Are you better off passing it through a TBC, with all the proc amp adjustments left at normal? To see just how much difference a TBC could make in the picture quality, I made two sets of copies of copies of the same video sequence, including a resolution test pattern.

The second generation copies were not much different. The TBC did add a wee bit of noise, visible in the black areas of the picture. By the third gener-

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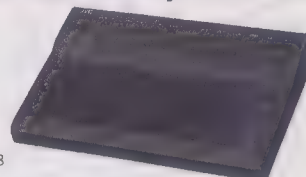
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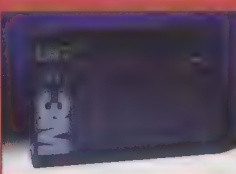
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ation, however, the TBC copies were emerging as superior. With the fifth- and sixth-generation copies, the TBC versions looked better, especially when a straight vertical line appeared in the picture. Circles (on our test pattern) took on a grotesque out-of-shape distortion in the non-TBC copies, but looked perfect in the TBC copies.

I made my most interesting discovery when I experimented to find out what would happen if a TBC was applied after making repeated copies without the TBC. This may at first sound absurd, but it's exactly what happens if you edit your videos at home without a TBC, then send them off to a professional dubbing facility to make copies, where they probably have a TBC in the signal chain.

Playing the non-TBC fifth-generation copy through the TBC produced worse results than anything I had previously seen, considerably worse than the sixth-generation copy made without any help from the TBC. The problems with this no-TBC-until-the-last-step video occurred around the edges of straight lines, which took on a randomly changing staggered quality. The circles did look slightly more circular, but

the tradeoff hardly seemed worth it.

It would appear that the accumulated drift of the uncorrected video timing requires the TBC to create a bigger, more noticeable change in the image, and that beyond a certain point, these changes make the image look worse, though the timing may be more stable. The conclusion for low-budget producers is that you shouldn't think of the TBC as a clean-up device which can simply be inserted at the end of the whole video editing process. It is clearly advantageous to have the TBC in the signal chain every step of the way.

The TBC is not a miracle worker, however. The only thing it really fixes is the timing of the video signal. A lot more can deteriorate. In the camera original resolution test pattern, horizontal resolution of over 300 lines was apparent. But by the third generation, that had dropped to 250, and it was down under 200 by the sixth.

The only way to eliminate all the problems of generation loss is with digital (nonlinear) video editing. But even with the advent of this new technology, there will still be an important role for the TBC, as most nonlinear systems work much better if the original tape signal is first passed through a TBC before recording on hard disk. So the TBC is increasingly becoming a must-have accessory for the semi-pro camcorder enthusiast. ■

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TECH TIPS

Push n' pop

On many VCRs, if you push the rewind button and then the eject button almost immediately afterwards, the tape will finish rewinding and then eject itself automatically.

Andrew Fernandez
La Grange Highlands, Illinois

Calling all tipsters

Do you know something we don't about VCRs, TVs, camcorders and the like? We'll share it with our readers as a Tech Tip, and give you credit and a \$25 bounty for each one we publish. Tips should be informative and to the point. Please include your name, address and phone number. Send tips to Video Magazine, 460 West 34 Street, New York, NY 10001. You can also send tips via CompuServe to 75147,1255 or by fax to 212-947-6500. The fax is open for readers after 5 p.m., EST, weekdays, and all day on weekends. ■

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LCD CAMCORDER FACE-OFF

We compare 5 big-screen shooting machines for picture, sound & features.

T BY TIMOTHY LIEBE
he gauntlet that Sharp threw down to its competitors last year with the introduction of the ViewCam line of LCD camcorders has been picked up. These camcorders, which either replace or augment the traditional eyepiece viewfinder with a large color LCD monitor, have proven so popular that Sony and JVC have jumped into the market, and Sharp has



Snap Decision: Sony's 8mm Handycam Snap, a no-frills "guilty pleasure."

updated its models. Panasonic has introduced an LCD camcorder in Japan, but it's not yet available here.

Given the number of LCD camcorders now on the market—and their widely varying configurations—we decided that a face-off between the models was in order. The LCD camcorders we tested were two 8mm models from Sony, the \$1,200 CCD-SC5 Handycam Snap and the \$999 CCD-FX730V; and Sharp's \$1,195 8mm VL-E36U ViewCam and \$2,199 Hi8 VL-H400U. We also tested JVC's \$1,099 GR-SV1U SystemMax, which is the only VHS-C LCD camcorder available in the U.S. (see "LCDs and VHS-C—A Good Match?").

Because each of these camcorders has an LCD screen and a tiny speaker, they let you watch your videos immediately after you shoot them, without hooking up an external monitor. They also work as travel TVCRs, so you can watch tapes dubbed from VHS or other sources. But the best thing about these LCD camcorders is that they're fun to shoot with. Subjects find them less intimidating, and frequently want to take a turn shooting. The Sharp and JVC models even have screen-reversal modes, so you can point the camera at yourself, and watch as you shoot.

We compared each camcorder in five areas: picture quality, audio quality, autofocus, battery life and features (including ergonomics). Participating in the shootout were myself, technical editor Lancelot Braithwaite, senior editor Brent Butterworth, assistant editor Stewart Applegath and editorial intern Janeen Renaghan.

HOW WE DID IT

Since picture quality is the most important factor to most consumers, we devised a series of tests to gauge image resolution, color accuracy, chrominance noise, luminance noise, and how

well the camcorders maintained proper white balance, exposure and focus under various lighting conditions. With each camcorder, we shot a resolution chart and color bars under halogen lighting with a color temperature of 3,000 degrees Kelvin, then shot a still-life sequence set up to challenge each camcorder with a variety of common "video problems" (i.e., black spots against reddish-orange, thin blue stripes against white) under incandescent light, fluorescent light and daylight. We then viewed all the sequences on a calibrated ProScan PS27152 monitor, switching between the camcorders in a double-blind test—we didn't know which camcorder each image was coming from, and noted our initial impressions based on the switcher number. We used

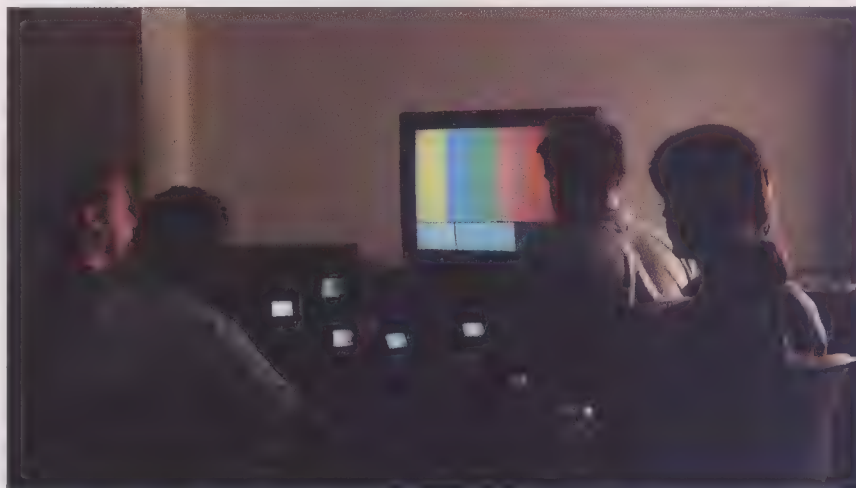
Different Strokes: Sharp's VL-H400U (left) and VL-E36U ViewCams, Hi8 with a 4-inch screen or 8mm with a 3-inch screen.



Fuji tape for all the camcorders.

Our audio tests were conducted in *Video Magazine's* acoustically treated home theater room (a moderately dead, 5,500-cubic-foot space with a calculated reverberation time of 0.8 seconds). We tested the camcorder microphones for overall sound quality, evenness of frequency response, and noise leakage from the zoom, autofocus and tape transport motors. In each case, we had a subject appear in the frame suddenly, both speaking and silent; we zoomed in and out—again, while speaking and while silent; we recorded two cuts of

Ready, Set, Go: *Video Magazine* viewing panel reads the LCD camcorders for testing.



FACE-OFF

LCDs & VHS-C: A Good Match?

JVC's GR-SV1U SystemMax is being touted not just for its use of VHS-C, but also for two features: Message Mode, which allows you to record and play video messages, and QwikPix, which records five-second sequences for rapid-fire cutting. Message Mode also allows you to monitor your own image being recorded. But neither feature is innovative. All Sharp's ViewCams can virtually duplicate Message Mode, and QwikPix duplicates the Hi8 VL-H400U's "snap" (digital still) feature. In addition, the SystemMax includes a fixed-focus lens, a 3x (4-12mm) zoom, autoexposure, auto white balance, video/audio input/output jacks, a three-inch LCD monitor with an on/off switch, and an optical viewfinder.

None of the panelists in our face-off (see main story) found the SystemMax enjoyable to shoot with. "It's uncomfortable to hold, and easy to stick your fingers in the way of the lens when you use the zoom controls—or even when you're simply shooting," said Stewart Applegath. The other panelists concurred. I found it annoying that the only indicator on the LCD screen is a battery dying graphic. All other indicators, even the all-important record indicator, are either in the optical viewfinder and/or in a tiny LCD display clumsily placed on the top where, if you swing the LCD screen up for shooting, you'll only be able to read the indicators with difficulty.

In picture quality, the SystemMax paled compared to the other camcorders. Lancelot Braithwaite noted "chrominance noise indoors and outdoors, along with overexposure of the outdoor test sequence." Brent Butterworth added that "the image looked washed-out, except outdoors where the colors were oversaturated, like Technicolor on steroids." I observed pronounced color ghosting in our still-lives under all lighting conditions; for example, dark blue bled into a nearby field of brown in one image. The sound fared no better. The mic produced the same sense of exaggerated room tone we heard with the Handycam Snap, and its frequency response was limited, especially on the low end. The SystemMax also had a noisy zoom motor

that could be heard whenever buttons were pressed.

Combining VHS-C's ease of use with a big viewfinder is a great idea and the SystemMax is the only VHS-format camcorder with an LCD viewfinder. But we can't recommend it. It's neither as enjoyable nor as easy to use as other LCD models, picture and sound are sub-par, and its features don't distinguish it enough to compensate. —TL

Swing Shift:
JVC's VHS-C SystemMax in shooting (top) and playback positions. The screen pivots up for use as a viewfinder.



music played from high-quality speakers and electronics to test frequency response; and finally, we recorded a brief conversation at both six feet and 10 feet to gauge how well "room tone"—the natural reverberance and noise of the room—was balanced against normal speaking.

Autofocus quality was judged by panning between two cards, one at six feet, one at 30 feet. The nearer card was a medium-contrast target—a Kodak 18-percent gray card with thin and thick black lines. The far target was a black card on a white wall. We performed the test in both standard room light (350 lux) and low light (30 lux).

We tested battery life by recording a test scene continuously with fully-charged batteries until the batteries died out, then noting the tape time elapsed. If a camcorder's LCD could be shut off, we performed the test twice: once with the LCD, once without. Ergonomics and features were judged by having all participants shoot with the camcorders, then write down their impressions.

PICTURE QUALITY

Surprisingly, the only Hi8 model in the lot, Sharp's VL-H400U, wasn't the winner in overall picture quality. As Brent Butterworth observed, "It's at best average for Hi8, with too much noise, somewhat low resolution, and so-so color accuracy...I'd rather have accurate color and low noise." Lance Braithwaite and Stewart Applegath concurred, preferring the pictures of Sharp's less-expensive 8mm VL-E36U and Sony's 8mm FX730V. I alone thought the Hi8 ViewCam's picture the best, although I expected better than 360 lines of resolution and fair-to-middling color from a Hi8 camcorder costing over \$2,000.

Brent and Lance both preferred the picture quality of the FX730V, with Stewart, Janeen and myself leaning more toward Sharp's 8mm ViewCam. Lance praised the Sony for its low noise, color accuracy and sharpness, even under low-light conditions. While Brent concurred, he added that the picture looked "ever so slightly washed out." I also thought the FX730V's color accuracy was better than the 8mm

Screen Door:

Side views of 8mm Sony's CCD-FX730V shows how LCD screen swings away for use as a monitor.

Sharp's, although its horizontal resolution (between 230 and 240 lines on the resolution chart) was about 10 lines less, although this is admittedly an infinitesimal difference.

Everyone concurred that the Snap's picture wasn't in the same league as those of the other 8mm camcorders. As Brent pointed out, "It's very grainy, and the auto exposure system seems primitive—it hasn't a clue how to handle sunlight. The color accuracy is pretty good, though," Stewart commented, "The fixed focus caused some problems in the picture test," while Lance remarked on the luminance noise outdoors as well as indoors, even though he agreed that the color was good.

While there's no consensus among our panelists as to which camcorder had the best picture, we all agreed that you could get a good picture with either the Sony FX730V or one of the ViewCams, and that while the Snap's



picture wasn't great, it was adequate for day-to-day shooting.

AUDIO QUALITY

Despite the fact that Sharp's Hi8 ViewCam is the only stereo camcorder of the lot, its audio quality under real-world conditions is not significantly

better than that of its less-expensive sibling. The zoom noise on the H400U is especially apparent, and can even be heard to some extent while a subject is talking—another disappointment for a high-end model like this. Its frequency response is only fair, and its ability to record natural-sounding conversation is also not as good as one would hope from a high-end model with a stereo mic. The E36U, on the other hand, has very good audio quality from its mono mic, and has the added benefit of barely noticeable zoom noise, even in total silence. Its frequency response was nearly as good as that of



the Hi8 ViewCam, and it created a convincing sense of room tone during recorded conversations.

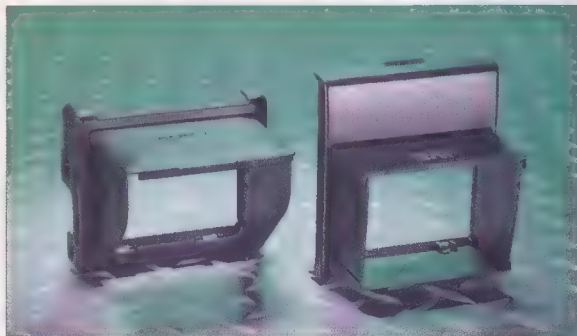
The Snap recorded far too much room tone during each phase of the test, making the videos sound echoey and amateurish. Its auto level control tended to overcompensate (resulting in some distortion) for casual conversation at 10 feet. It recorded an obnoxious click when the telephoto adapter was engaged (there was also a visible switching of lenses).

But the worst aural offender was Sony's FX730V, which generated noticeable tape transport noise throughout the audio test. These noises could be heard during all the tests, even outdoors on a windy day. There were also slight but discernable zoom and autofocus noises. Under these conditions, it was hard to judge how it handled either the music we used for frequency response tests, or how it handled room tone during casual conversation.

AUTOFOCUS

Of the camcorders we tested, only three—the two ViewCams and Sony's FX730—have any form of autofocus. The Snap uses a fixed-focus lens, which explains why its "zooming" capability is

continued on page 88



Helpful Extras:

A supplied sun hood for Sony's Snap and an optional one for JVC's SystemMax (top), and supplied remotes for Sharp's VL-H400U and Sony's CCD-FX730V and Snap.

S

Are you overlooking video's best big-picture machines for your home theater?

Suppose that the members of a wine-tasting club drank nothing but Boone's Farm? What would you think? Or if a self-proclaimed sports-car enthusiast who drove nothing but four-doors? Or if the office fashion plate shopped only at Target? You'd think there's a big gap between ambition and reality, that maybe it's time for these people to get serious.

Front projectors offer the best big-screen video picture you can get. But while they're an everyday sight in offices and sports bars, they've only made their way into a handful of homes.

It's time for that to change. With HDTV on the horizon, with home theater growing in popularity, and with computers and multimedia becoming a part of everyday life, the advanced display technology in front projectors

the special demands it places on you and your living room. We'll also take a look at some of this year's most interesting projectors, as seen at June's Los Angeles INFOCOMM show, which included a huge shootout of all types of front projectors. And we'll give you a peek at some of the new projection technologies that hold promise for the future.

FRONT-PROJECTION BASICS

Front projectors are those that project an image onto a separate screen—for this reason, they're sometimes called two-piece projectors. There are two common types of front projectors: cathode-ray tube (CRT) and liquid-crystal display (LCD). There's also the light-valve, which is currently limited to large commercial installations (see "Light-Valves & Micro-mirrors").

CRT projectors use three picture tubes, one each for red, green and blue. The three tubes must be precisely aligned, or converged. Otherwise, objects in the picture will have fringes of one or two of the primary colors, and the picture will appear unfocused. There are two types of convergence: dynamic and static. Static convergence lets you adjust the convergence in the center of the screen using crosshairs (you've probably noticed this in rear-projection TVs). That gets the center in fine, but may leave the edges out of whack.

Dynamic convergence allows adjustment across the entire screen.



Most video enthusiasts fall into the same trap. They stick with readily available direct-view and rear-projection big-screen TVs, ignoring the best video monitor technology available today—front projection—even though it often carries only a very small price premium.

makes more sense than ever. But getting into front projection takes a lot more thought than simply laying down the plastic at Circuit City and heading home to wait for the delivery. In this article, we'll tell you why you should consider front projection, and examine

FRONT PRO

THE CASE FOR...



Great Graphics:
Sony's VPH-1271Q

Most CRT projectors include a couple dozen dynamic convergence controls. But it's a job best left to professionals—it usually takes about two hours and lots of patience. To me, it's like trueing bike wheels, because adjusting one thing usually throws off another. And it needs to be done about once a year (every six months if you're picky), because settings drift over time.

LCD projectors, on the other hand, require no convergence and only a very simple setup procedure. Just point the projector at the screen, zoom the lens so that the images fills the screen, focus the image and you're done. It's easier than programming a VCR. Because of this simplicity, LCD projectors are generally considered the wave of the future.

An LCD projector uses a bright bulb as a light source, funneling its light through either one or three LCD panels. Because the panels are fixed in place, convergence is permanent (although not always perfect). Single-panel LCD projectors, like the tiny, \$800 Sony CPJ-7, simply blast the light

through a single color LCD panel. But better, brighter projectors split the light into red, green and blue components through the use of dichroic mirrors. They use a separate, monochromatic LCD panel for each color, then recombine the three and project the light out through the lens.

All LCD projectors suffer from two problems, to greater or lesser degrees. One is a lack of contrast. CRT projectors can shut off their light output entirely, dropping to a nice, clean black. But because LCD panels are not completely opaque to the light blasting through them, it's harder for them to drop to a dead black. Also, LCD panels are made up of distinct picture elements, or pixels, and the pixel structure is usually apparent to some degree.

Whether they're LCD or CRT, projectors fall into three classes: video grade, data grade and graphics grade.

The difference lies in the projectors' horizontal scan rates—the number of times per second the projector traces a horizontal line across the screen. The higher the horizontal scan rate, the more picture resolution the projector can show.

Most home theaters use video-grade projectors, which typically offer only the 15.75-kilohertz scan rate used by our NTSC video system. With prices ranging from about \$2,000 to \$8,000, video-grade projectors are fairly affordable, and they give you a much bigger picture than you'll get with a rear-projection set.

The problem with video-grade projectors is that they blow up NTSC pic-



tures to a size far larger than the creators of the system ever intended. The result is that the horizontal scan lines are very visible. Some viewers don't

PROJECTORS

PROJECTION

Light-Valves & Micro-Mirrors

Front-projection video may be poised for a revolution. Two technologies—one proven in the field, one still on the drawing board—could well steal a big share of the front-projection market from the dominant CRT and LCD technologies.

The first is technology light valves. Light valves have been around for years—you may have noticed GE's gigantic Talaria light-valve projectors in sports arenas or the sports-book areas in Vegas casinos. A light-valve projector is like a souped-up, three-panel LCD projector. It uses three small CRTs to create images on liquid-crystal panels. Light from a xenon arc lamp (split into red, green and blue beams) passes through the LCD panels. Sometimes it's set straight out from the panels through a lens, sometimes the light is recombined and sent out through a single lens. Light-valve projectors can put out amazingly bright, sharp

and large pictures. At INFOCOMM, light-valve projectors from Ampro, Barco as well as Hughes/JVC (fed by a line doubler) lit up huge, theater-size screens with filmlike video. If I didn't know better, I'd have thought I was in a movie theater.

Recently, light valves have come down in price—the least expensive model I've seen, Ampro's 7000D, lists for "only" \$47,490. Hughes/JVC has made a big splash with its projectors, which cost from \$50,000 to more than \$100,000, but it's planning a consumer version for 1995 that will cost between \$2,500 and \$3,000.

The other breakthrough is from Texas

mind them, others can't stand them.

The solution is a line doubler. This doubles the apparent resolution of an NTSC frame by displaying both of the fields that make up that frame simultaneously, rather than one after the other. Unfortunately, because line doublers double the scanning lines, they can only be used with projectors capable of twice the NTSC scan rate, or 31.5 kHz.

Such projectors are called data-grade models. They're also capable of displaying computer images, and will be able to faithfully reproduce HDTV images when HDTV broadcasts and source devices are available. They start at about \$10,000. If this seems expensive, consider that the currently fashionable rig for high-end home theater is two data-grade projectors, stacked and converged together for extra brightness.

Graphics-grade projectors are essentially souped-up data-grade models, capable of scan rates of 60 kHz or

more. A few years ago, graphics-grade projectors were rare, but they're becoming increasingly common as the demands of computer graphics rise. Even though they start at about \$30,000, a few graphics-grade models have found their way into very high-

end home theaters.

Front projectors have always skirted the line between professional and consumer products. The Federal Communications Commission, however, draws a sharp line between the two applications. It lumps projectors into two classes: commercial (Class A) and home (Class B). While it's technically illegal for Class A projectors to be sold to consumers, industry insiders tell me they frequently make their way into home theaters anyway.

Either way, you can't just waltz into a department store and score a new projector. You have two choices: Use a custom home theater installer (your best bet), or try a local pro A/V dealer.

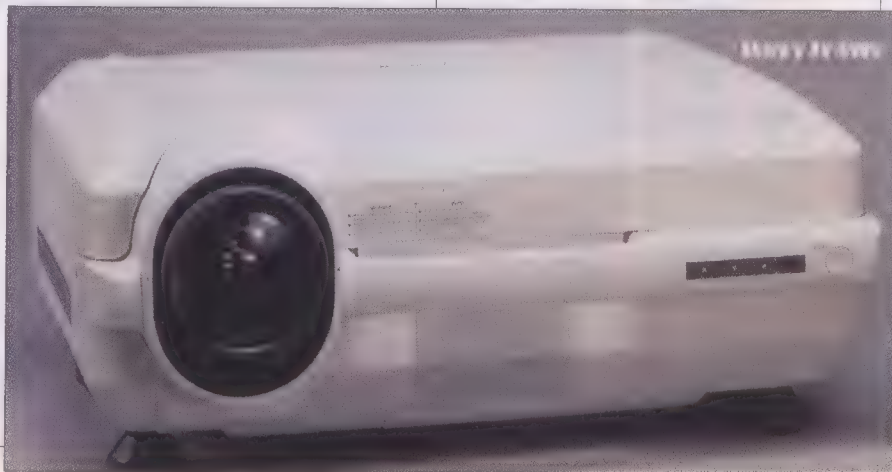
WHAT'S SO GREAT ABOUT FRONT PROJECTION?

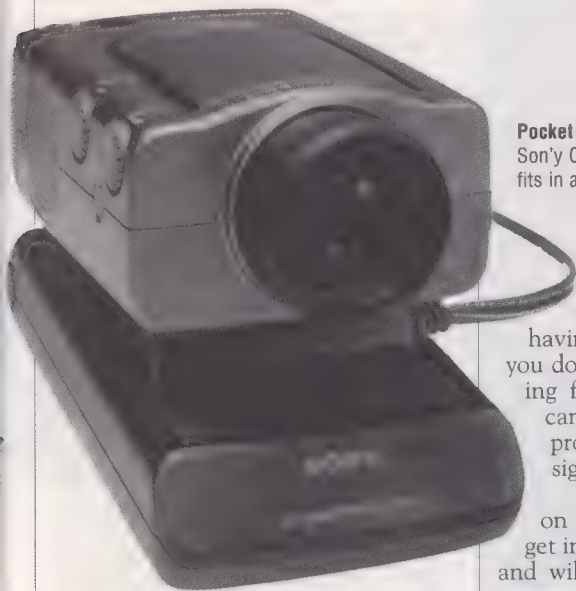
Two things: First, the picture's bigger. Any decent front projector can give you an image measuring at least six feet diagonally; many run to 10 feet or more. And there's no arguing with the fact that a bigger picture gives you a more theatrical effect—real home theater, instead of just a big TV.

Second, the picture can look better than direct-view pictures. Some theorize that because a front video projector directs light onto a screen, like a film projector, the look is more film-like. Some argue that because CRT projectors use separate tubes for each color, the manufacturers don't have to worry about how well the phosphors can co-exist—the phosphors are in separate tubes. Some say that because CRT projectors don't use phosphor stripes or



Power Projection:
Hughes/JVC's Series
300 ILA
light-valve projector.





Pocket Projector:
Sony's CPJ-7 LCD projector
fits in a camcorder bag.

dots as direct-view sets do, they're capable of sharper pictures and higher resolution.

I say a CRT front projector can look great because a technician comes to your home and calibrates it. With direct-view and rear-projection sets, you're stuck with factory calibration (usually done in a matter of minutes) that often worsens during shipping.

CAN YOU DEAL WITH IT?

Front projection sets can be difficult to live with. The big problem is that you need a totally dark room, or the picture will wash out—no more lazy Sundays basking in the sun coming through the living-room windows as you watch the Broncos cream the Cowboys. One solution is to place an inexpensive direct-view set behind the projection screen, and only lower the screen when you want the big picture.

There's also a problem with user-friendliness. Almost all projectors are video monitors only, not monitor/receivers. In other words, there's no tuner—and no picture-in-picture, no sleep timer, no favorite-channel programming. There's usually not even a speaker! Zenith and Vidikron have made a few projectors with all the creature comforts of your typical Trinitron, but in the vast majority of cases, you'll have to supply the tuner (or use the tuner in your VCR) and the sound system. And figuring out how to get all this stuff up and running may be beyond many family members.

Once past these concerns, front projectors have a big advantage over other TVs: They take up very little room. The best way to mount them is on the ceiling, where they're completely out of the way. This also lets you set

up high-end speakers without worrying about the effect of having a big box between them. If you don't like the look of a box hanging from the ceiling, your installer can put in a lift that will pull the projector up into the ceiling, out of sight, when it's not used.

You can set up a projector on a small table, but it'll probably get in the way of your center speaker, and will take up valuable floor space

besides. Long-throw LCD projectors like Vidikron's Crystal One are the easiest—just set them up on a high shelf in the back of the room.

WHAT'S HOT

The best place to see front projectors on display is at the INFOCOMM show, held each summer for audio/video professionals. (Next year's exhibit will run from June 15 to 17 in

Continued to p.94

Screen Choices: Fixed, Curved, Motored & More

There's lot of competition among projection screen makers, so consumers have lots of options. The most convenient type of screen pulls down from the ceiling, or lowers electronically. Many, however, are fixed on a wall. Curved screens were popular in the early days of front-projection, when every ounce of brightness was needed, but are now out of favor.

One interesting trend in screens is motorized masking for different aspect ratios, as found in many movie theaters. Draper offers a cool system operated by an infrared remote that can mask vertically or horizontally. A masking system combined with Draper's 100-inch Eclipse screen costs about \$1,500.

Some other companies have concentrated on creating screens that meet THX specifications for sonic transparency. The advantage of such a screen is that it lets you put your center speaker (or all three front speakers) behind the screen. Uni-Screen offered the first THX-certified screen, and a

version by Stewart Filmscreen should be out by the time you read this. The screens use tiny perforations to let the high frequencies move through (lower frequencies get through on their own).

Make sure your installer doesn't go overboard when specifying screen gain, which is the amount of light reflected back by the screen. Video

monitor maven Joe Kane (see last month's "Home Theater") usually recommends a screen with a gain of 1.3, like the Stewart Filmscreen StudioTek 130. Screens with a gain of more than 1.5 give you more brightness, but frequently produce "hot-spotting," or excessive brightness in the center of the picture. They can also give the picture an unnatural sheen.

—BB



Max Mattes:
The motorized masking on this Draper Eclipse screen permits automatic aspect ratio adjustment.

BY KEN KORMAN

BUILDING A BETTER BEAST

How an A-Team of F/X artists created the hi-tech breakthroughs that gave 'Jurassic Park' bite.

From the mythic creations of special effects pioneer Ray Harryhausen to the nuclear nightmare of Godzilla, prehistoric beasts have served Hollywood well as primal objects of awe and terror. A big fan of these and other Saturday matinee horror classics, director Stephen Spielberg knew just what he had to do when he signed on to direct the movie version of Michael Crichton's novel *Jurassic Park*. "He wanted the dinosaurs to behave as animals, not monsters," explains Phil Tippett, the man who became the king of stop-motion animation when Harryhausen retired, and one of the four masters of special effects Spielberg hired to conjure Jurassic magic. "He didn't want it to degenerate into a monster movie."

Sounds simple. But after years of creating memorable creatures for blockbusters like *E.T.: The Extra-Terrestrial* and *Close Encounters of the Third Kind*, Spielberg knew how difficult the task would be. Still, the director only seemed interested in the project if he could bring dinosaurs to life as no filmmaker had done before. To pull it off, he assembled an A-team of the best and the brightest in special effects, and pushed them to reinvent their own technologies. It was a risky proposition. "We had no idea this was going to work at all," says Tippett, who had won an Oscar for his work on *Return of the Jedi*. But the results, especially now that *Jurassic Park* is available for frame-by-frame scrutiny on videocassette and laserdisc, speak for themselves.

Spielberg's four effects wizards, each a master in his own area of specialization, collaborated for three years on *Jurassic Park*, assisted by private teams of F/X veterans. In a joint interview with *Video Magazine*, the four talked about how they devised the pioneering effects for the film, displaying as they talked a deep respect for one another as well as the spirited sense of rivalry that helped them raise the technological ante for movie creatures. The group consisted of:

• Stan Winston, who had started as

Star Power:
Spielberg
and Raptor, a
dinosaur that
could take
direction





Byte Patrol:
Virtual beast
threatens an
actual actor.

a makeup effects artist before graduating to large-scale mechanical creations for movies like *Aliens* and *Terminator 2: Judgment Day*.

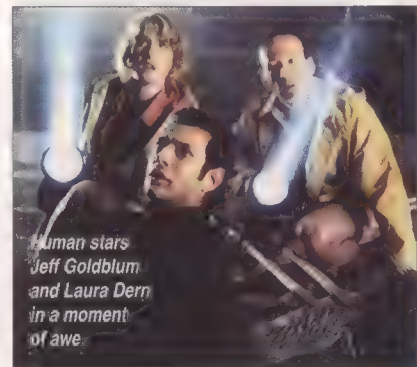
- Dennis Muren, who serves as effects supervisor for George Lucas' Industrial Light and Magic (ILM), the company that invented computer-generated special effects.

- Michael Lantieri, who handles what are known as physical effects and who cut his teeth on the ground-breaking *Who Framed Roger Rabbit*.

- Phil Tippett, who originated the "go-motion" process, a computerized upgrade of traditional stop-motion animation.

Spielberg accepted the *Park* project six months before Crichton's best-seller arrived in stores. He first hired production designer Rick Carter, who had impressed Spielberg with his work on the director's version of *Empire of the Sun* and his TV series *Amazing Stories*. Carter soon had conceptual illustrators and storyboard artists fleshing out ideas from galleys of the novel to inspire further interest, and potential funding, from Universal Pictures.

Stan Winston soon joined the fray, and assigned one of his best illustrators to design a new kind of dinosaur, one that reflected the latest paleontological findings: the beast should be more nimble and bird-like than previous movie



Human stars
Jeff Goldblum
and Laura Dern
in a moment
of awe.

dinosaurs, and less like a lumbering hulk. "We had a great respect for scientific fact," Winston says. "Our wish was to create the most dramatically accurate dinosaurs anyone had ever seen." Michael Lantieri also came into the project early to help Spielberg narrow down the methods for creating the full-size creations the director had begun to envision. The work by Muren's computer graphics (CG) team and Tippett's stop-motion animators was intended to merely fill in the gaps left by the large physical creations that would account for the bulk of the effects work. But this was not how things eventually turned out.

Winston's studio was assigned the mammoth task of creating life-size dinosaurs that could take direction from Spielberg as if they were actors, as new ideas occurred to Spielberg on the set. This would be achieved in a variety of ways, but largely through puppetry. The idea was to mechanically manipulate the creatures by rods and wires, or through the hydraulic systems created for larger creatures like the tyrannosaurus rex. Some of the full-body movements for smaller animals like the raptors would be handled by putting a man inside a raptor suit. Almost everything else would have to be done by stop-motion animation--the frame-by-frame manipulation of small-scale, physical creations. But this traditional technique didn't really produce the realism everyone was seeking for *Jurassic Park*.

LM's computer graphics experts

soon went to work on their own to up the reality factor. A few clandestine experiments had staff specialists clamoring for a bigger share of the effects work. The painstaking process of rendering computer graphics had gradually improved, and they thought they could do a better job than the stop-motion stylists. "Over the years--primarily with *T2* and *Death Becomes Her*--our software became much more user-friendly," Muren explains. "And our guys sudden-



Reality Check: Raptors mixed computer graphics and rubber-suited actors.

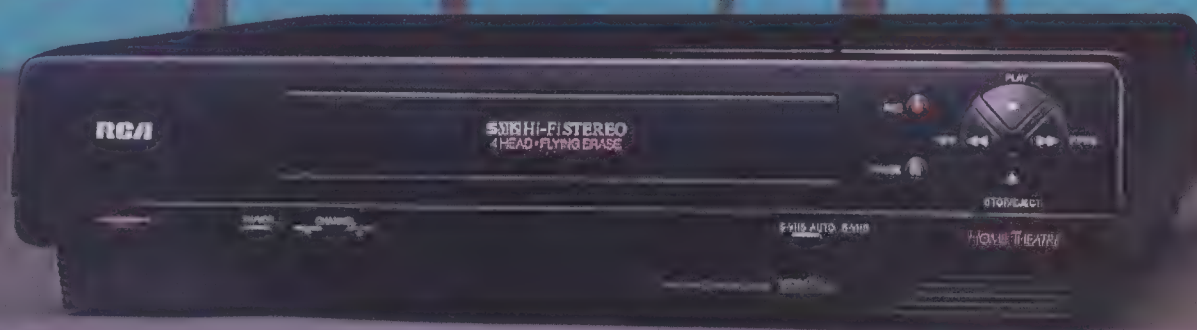
ly had the experience to get an image that closely represents what's in their minds."

When Spielberg and the rest of the production team finally looked at ILM's private test sequences, they could hardly believe their eyes. Photo-realistic computer-generated images had finally arrived. Because the results were more realistic than anything achieved through stop-motion, the work-load, and the film's budget, was reorganized in ILM's favor.

Tippett and his 30 stop-motion animators were suddenly left out in the cold, wondering whether advances in computer graphics had overnight

continued on page 98

A Few Good



These days, the makers of S-VHS VCRs are taking a calmer, wiser approach to selling their high-grade, high-band recorders. The format that was once ballyhooed as "the next generation in video," a fit rival to the laserdisc in picture quality, has never made more than a dent in the home video marketplace. But it has taken the high ground with a cadre of feature-packed decks that videophiles can overlook only at their viewing peril.

Manufacturers have woken up and smelled the coffee. The unrealistic promotions that accompanied the format's introduction in 1987 have faded. So too, as some proponents acknowledge, have efforts to market S-VHS to mainstream VCR buyers. Now, S-VHS is likelier to be positioned as the ideal format for critical viewers who have large TVs and high-quality cable or satellite-fed programs that are worth taping and viewing well.

The format is serving,

*Our buying guide
for S-VHS VCRs,
an elite corps in the
push for high-end
performance.*

BY JONATHAN TAKIFF

too, as a wonderful tool for editing camcorder tapes that will later be copied and sent to friends or relatives. With picture resolution to spare—400 lines of horizontal resolution versus the approximately 240 lines typical of standard VHS—dubs made from S-VHS masters show little of the generational image loss that afflicts conventional VHS-to-VHS copying. And of course, S-VHS decks do double duty, offering refined reproduction and recording of standard VHS tapes.

S-VHS sales stubbornly hover at just one to two percent of the 13 million VHS decks sold annually in the U.S. Several major brands—including Philips, Magnavox, Samsung, Sanyo, Sharp and Toshiba—don't even field S-VHS anymore, and those that do offer only



Two Supers: RCA's \$749 VR721HF (above) with jog/shuttle buttons, and JVC's BR-S378U (left), which has a special effects processor.

BUYING GUIDE

• BRAND	• MODEL	• PRICE	• RANDOM ASSEMBLE EDIT SEGMENTS	• AUDIO LEVEL CONTROL	• CABLE BOX CONTROL (DECK/REMOTE)	• JOG/SHUTTLE WHEEL (DECK/REMOTE)	• UNIVERSAL REMOTE	• FRONT INPUTS (AUDIO/VIDEO/SVHS/PAUSE)	• MIC INPUT	• VHS INDEX SEARCH SYSTEM	• AUTO TAPE OPTIMIZER	• SPECIAL FEATURES
HITACHI	VT-S772A	\$899	6	Y	N	Remote	Y	A/V	N	Y	N	AI, Edit Switch, IR, Magic Door Tape Loading, Titler
JVC	HR-S5100	\$899	8	N	Remote	Deck	Y	A/V/S/P	N	N	N	AD, AR, AVL, CS, FMC, HBS, IAS, IE, MBEC (Opt), ML, PFB, RT
JVC	HR-S7100	\$1,099	8	N	Remote	Both	Y	A/V/S/P	Y	N	N	AD, AR, AVL, CS, FMC, HBS, IAS, IE, IR, MBEC, ML, RT
JVC PROFESSIONAL	SR-S360U	\$1,130	8	N	N	Both	N	A/V/S	N	N	N	HM, HBS, IE, Opt. Wired Remote
JVC PROFESSIONAL	BR-S378U	\$1,285	N	Y	N	Deck	N	N	Y	N	N	CP, Opt. Wired Remote, PRE, 2AVIO, Video On Sound
MITSUBISHI	HS-U770	\$949	N	Y	Deck/ Rem. (Opt)	Both	Y	A/V	N	Y	Y	A/B, Child Lock, CS, DS, ML, PFB, PRE, RC, SBT, Super Quick View
PANASONIC	PV-S4480	\$1,099	8	Y	Deck	Both	Y	A/V	N	Y	Y	ADS, Auto Repeat, CS, DMS, DAP, DAT, PFB, TBC, 2VCR
PANASONIC PROFESSIONAL	AG-1970	\$1,850	Opt	Y	N	Deck	N	A/V/S/P	Y	Y	N	AD, DYC, Edit Switch, ET, HM, Search With Sound, 2AVIO, TBC
PANASONIC PROFESSIONAL	AG-5700	\$1,900	N	Y	N	N	N	N	N	N	N	Auto Repeat, Opt. Wired Remote, RS-232 Interface
RCA	VR721HF	\$749	N	N	Deck	Both*	Y	N	N	Y	N	A/V Dubbing, Blank Search, CS, PC, PFB, 2VCR
SONY	SLV-R1000	\$1,299	N	Y	Remote	Both	Y	A/V/S	N	N	Y	CONS, COSH, Command Mode, CS, DMS, IE, SYE, TTS

KEY TO ABBREVIATIONS

* Digital version, uses buttons instead of wheel

Y: yes, feature present; **N:** no, feature absent; **Opt:** optional. **SPECIAL FEATURES.** **A/B:** antenna A/B; **AD:** audio dub; **ADS:** auto daylight-savings time change; **AI:** artificial intelligence for picture enhancement; **ASD:** auto S detail switch; **AVL:** A/V component link; **BM:** book mark search; **CONS:** control-S input for editing; **COSH:** context-sensitive onscreen help; **CP:** color processor for F/X; **CS:** commercial skip, intervals vary with brand; **DAP:** digital auto picture; **DAT:** digital auto tracking; **DMS:** dual-mode shuttle controls; **DS:** date stamp; **DYC:** digital Y/C separation circuitry; **ET:** 5-pin editing terminal (for controller, 2nd VCR or camcorder); **FMC:** family message center; **HM:** headphone monitor terminal with volume control; **HBS:** Hyper-Bass Sound; **IAS:** intelligent audio switching noise reduction; **IE:** insert edit; **IR:** illuminated remote; **ML:** multilingual (English, French, Spanish) onscreen operating system; **MBEC:** multibrand random access edit controller; **PC:** previous channel monitors 2 channels; **PFB:** power-failure backup, varies with brand; **PRE:** preroll and record review; **RC:** record cancel returns to previous edit point; **RT:** retake, moves tape using shuttle ring during record-pause to edit out segments; **SBT:** search by time; **SEJ:** synchro edit jack; **SYE:** synchro edit with control L for camcorder; **2AVIO:** 2 sets A/V and S jacks; **2VCR:** synchronized 2-VCR remote for editing; **TBC:** timebase corrector; **TTS:** twin tape stabilizer

one or two models. "For viewers seeking high quality playback of motion pictures, the laserdisc is taking the place of the high-quality VCR," sniffs Quasar marketing manager Scott Olson, whose company gave up on S-VHS two years ago.

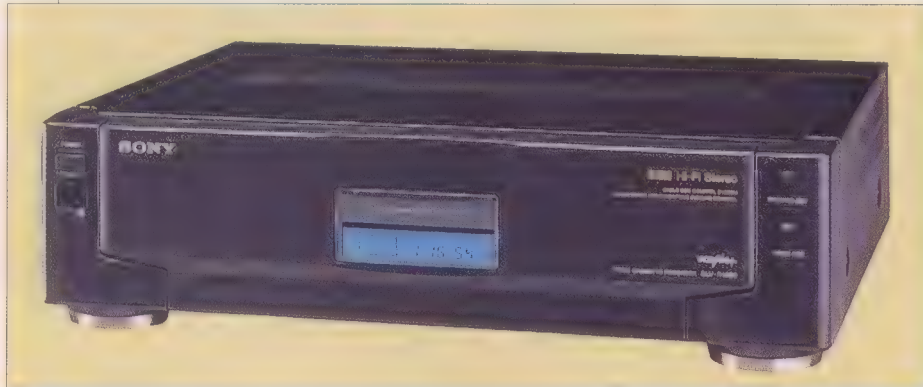
Things might have turned out differently had manufacturers followed Panasonic's lead in 1991, when it added "Quasi-S-VHS" to all its standard VHS

decks. The circuit allows VHS decks to play S-VHS recordings, albeit with the performance characteristics of VHS tape. "If other brands had gotten behind Quasi-S-VHS, we could have built up a base of 30 million S-compatible VCRs in a few years," says Panasonic's Bill Mannion, assistant general manager of the video division. "We'd have solved the chicken-versus-egg, hardware-software dilemma. That

base of decks would have given software manufacturers enough incentive to produce titles for the format and for retailers to carry it."

Unfortunately, other makers declined to spend the "couple bucks" it cost to add Quasi-S-VHS circuits, putting Panasonic at a price disadvantage and forcing the maker by 1993 to limit the circuit's use to "select, high-end models."

GOOD DECKS



Upper Decks:

Sony's SLV-R1000 includes cable box control, while Panasonic's AG-1970 lets you search with sound.

In fact, the software part of the S-VHS equation was never really solved. Prerecorded movies and programs for S-VHS are virtually non-existent. San Francisco's Super Source Video, sole supplier of S-VHS movies to hardware makers and the public, is phasing out "the last of our inventory" of about 50 titles, according to company president Hamilton Bryan. Several VCR makers once packed Super Source tapes with their decks. But now Bryan is suing the last of his clients for breach of contract, claiming it abandoned a purchase order in mid-deal. Not a pretty picture.

Blank tape prices are also a sore point. Because of special requirements, low demand for the decks and little competition, S-VHS blanks easily cost four times as much as conventional T-120 VHS tapes. For efficient timeshifters, who quickly watch and reuse their tapes, the premium prices aren't a problem. But tape duplicators, who use masses of blanks and search hard for low prices, have turned the other reel on S-VHS. And the average guy who's just looking to stockpile episodes of his favorite sitcom or sci-fi show? He's just been left out in the cold.

THE GOOD NEWS

The picture's not entirely bleak.

The format is flourishing in industrial and broadcast circles, with heavy-duty S-VHS decks (and camcorders) by JVC, Panasonic and Sony supplanting the venerable U-Matic workhorses at prices ranging from \$1,100 to \$9,400. Sanyo also makes a unique pro-quality S-VHS deck with frame-by-frame recording capability, which makes it great for animation work.

On the consumer front, savvy shoppers can benefit from the format's many perks. A small, select crew of new feature-laden S-VHS models are available, as the accompanying chart shows, from Hitachi, JVC, Mitsubishi, Panasonic, RCA and Sony. They come with suggested prices as low as \$749, for RCA's VR721HE. Although we set a ceiling of \$2,000 for this chart, many models are under \$1,000, which was once the least you could expect to pay, discounted, for S-VHS. (Arguably, prices would be even lower, if S-VHS decks were to begin selling in decent numbers.) If you can find them, you'll do even better with recently closed-out models like the Panasonic PV-S4366, once regularly sighted at \$599, or the JVC HR-S4900 and HR-S6900, which are virtually the same, save for cosmetics, as the newly introduced HR-S5100 and HR-S7100.

JVC's introduction of longer playing

S-VHS tapes (labeled T-210, ST210-XZA and STC-40) in full and compact sizes is also "good news for the format," according to Bill Sims, general manager of the company's video division. The ST210-XZA offers three and a half hours at the SP speed. The diminutive STC-40 tape, running at EP speed, can capture two hours of high-band video, finally allowing an entire school musical, football game or feature film to be crammed onto a single compact cassette, and with higher resolution at EP than is possible with SP-recorded conventional VHS.

S-VHS backers like Sims also cheer the arrival of the small-dish Digital Satellite System, which has begun pumping dozens of channels of programs at 400 lines of resolution around the clock. For home timeshifters, only S-VHS, Hi8 (or Sony's virtually faded ED-Beta format) can capture DSS entertainment in all its vivid glory.

An inadvertent boost to S-VHS may come with the next generation of digital VCRs. While promising perfect dubbing of camcorder tapes, digital VCRs are likely to include advanced copy protection schemes that will impede the taping of pay-TV programs. S-VHS, as the best and last of the analog recorders, may still be able to nab shows its "betters" cannot.

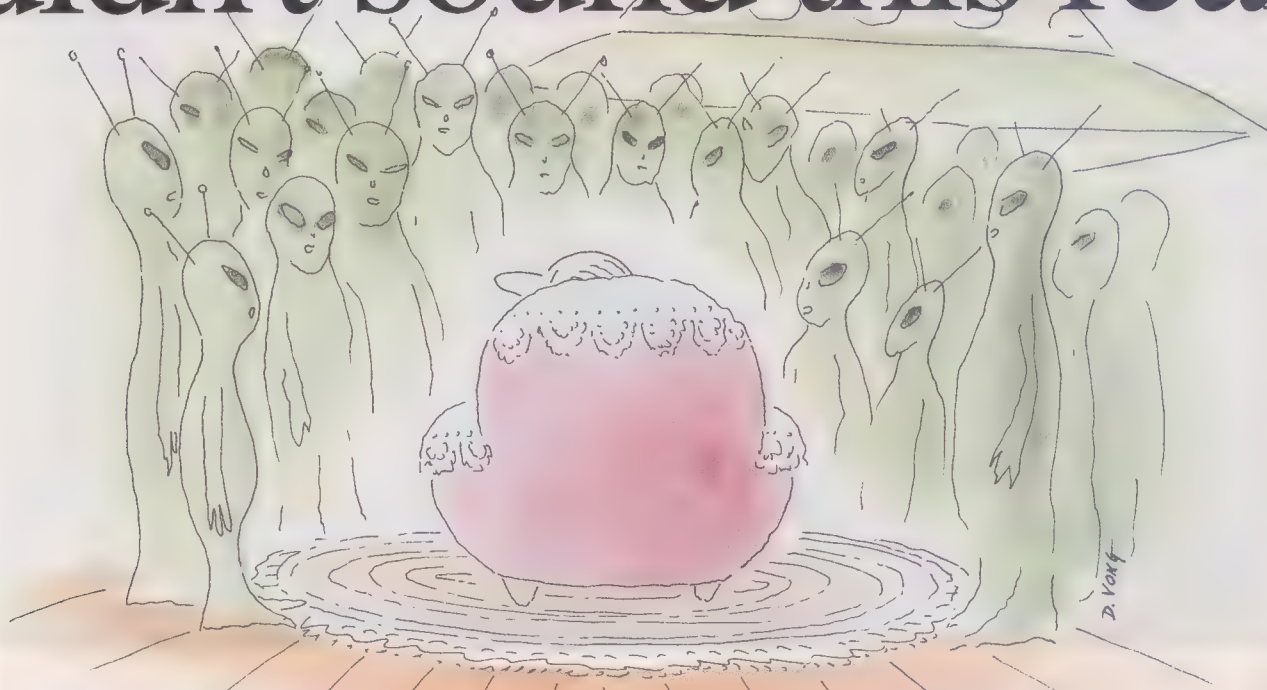
WHAT'S ON BOARD

Shoppers for S-VHS decks can hardly go wrong with any of the models now on shelves. Every one is a top-of-the-line machine that's chock full of features, including on most models, quick-start mechanisms that get the system up and running in as little as 0.3 seconds. Other standard features include digital auto tracking, video noise reduction, flying erase heads for seamless segment splicing and insert editing, and a rash of trick-play special effects, like variable speed slow motion.

Most S-VHS decks also offer automatic operation with record-protected cassettes, high-speed rewind, automatic head cleaning and real-time counters. And all come with multibrand remote controls that handle TV and VCR functions, sometimes cable box operations and, in the case of RCA's VR721HE, a DSS receiver.

continued on page 108

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Drive, He Said:
Media Lab researcher
Pierre St. Hilaire ex-
amines computer-
generated video holo-
gram of a Honda.

VIDEO'S FOURTH DIMENSION

I'm sorry to have to tell you this, but your home videos are flat. It doesn't matter how good your camcorder is, or how elaborate your editing suite. It doesn't matter that you've added dazzling graphics or sizzling sound tracks. They lack dimension. I'm not making a value judgement, just stating a fact. Video has no depth.

At least, so far.

Down in the basement at the MIT Media Laboratory in Cambridge, Massachusetts, a handful of researchers have

*Chasing Hologram:
moving images on
a virtual stage.*

devoted the last eight years to giving video a degree of depth that has only existed in science fiction. They are building a real-time, interactive, three-dimensional display—a virtual reality system that doesn't use goggles, glasses,

helmets or any other head-mounted viewing device.

Blocks tumble, jugglers juggle and miniature lab-coated scientists stare back at the viewer, floating in front of the system's final imaging lens, tempting you to reach out and touch their laser-saturated reds, greens and blues. But you can't. The images only appear to dance in real, dimensional space.

At the Media Lab, they call this emerging medium hologram. "Holographic video is the ultimate visual dis-

play, it's that simple," says Mark Lucente, a holographer who's spent years trying to simplify the medium's mathematics. "The only way to stimulate the visual cortex more effectively is to plug into it electronically."

To look at this work is to glimpse a tantalizing vision of home video's future. Not the immediate future, but not an unreachable one either, nor an unfamiliar one. After all, it's been in the public eye at least since the miniature holo-video of Princess Leia, *Star Wars'* plucky heroine, first pleaded for Luke Skywalker's help back in 1977. Although R2D2 broke some of the laws of physics to relay Leia's cry for help, the idea of holographic images moving, talking, cavorting in fully dimensional space has long been the stuff of science fiction. But since *Star Wars*, holographic projection has become an increasingly frequent motif in movies and TV shows, including *Star Trek: The Next Generation*, *Superman*, *Wild Palms* and, most recently, *Tek War*.

In fact, people have grown so accustomed to seeing holographic projections on TV shows they sometimes forget the technology is still fictitious. Professor Stephen Benton, head of the Media Lab's holography group, has a lot of experience with this. Visitors to the group's fourth floor digs "look at everything we've got," says Benton, referring to a collection of flat holographic renderings of cars, faces and an Absolut Vodka ad, "then ask, Where are the holograms?"

Apparently, they're expecting Princess Leia.

Yet while movies were creating an impression that video holography was just around the corner, researchers were ignoring the subject. For years, no one even bothered to work on the problem. Emmett Leith, who made the first 3-D hologram in 1962 with colleague Juris Upatnieks, had said it was impossible. The technical community so esteemed Leith that no one questioned his declaration until Benton started his holo-video project in 1986.

Two major problems had to be solved: how to build a device with enough resolution to display a hologram in video form, and how to get a hologram onto the display. For a long time, these were formidable, paralyzing difficulties.

Looking at a hologram of an object is almost exactly like looking at the thing itself. Let's say we're looking at a small model of a Honda. We see the Honda because light bounces and scatters off planes and curves, sending some into our eyes. A hologram is an artificial way of producing the same effect.

The most obvious way to make a hologram is put the Honda inside a sort of holographic camera and photographically record the way the Honda scatters laser light. But the approach presents problems. First, scientists have to deal with the issue of image resolution. The light-sensitive materials used to record holograms have to be hun-

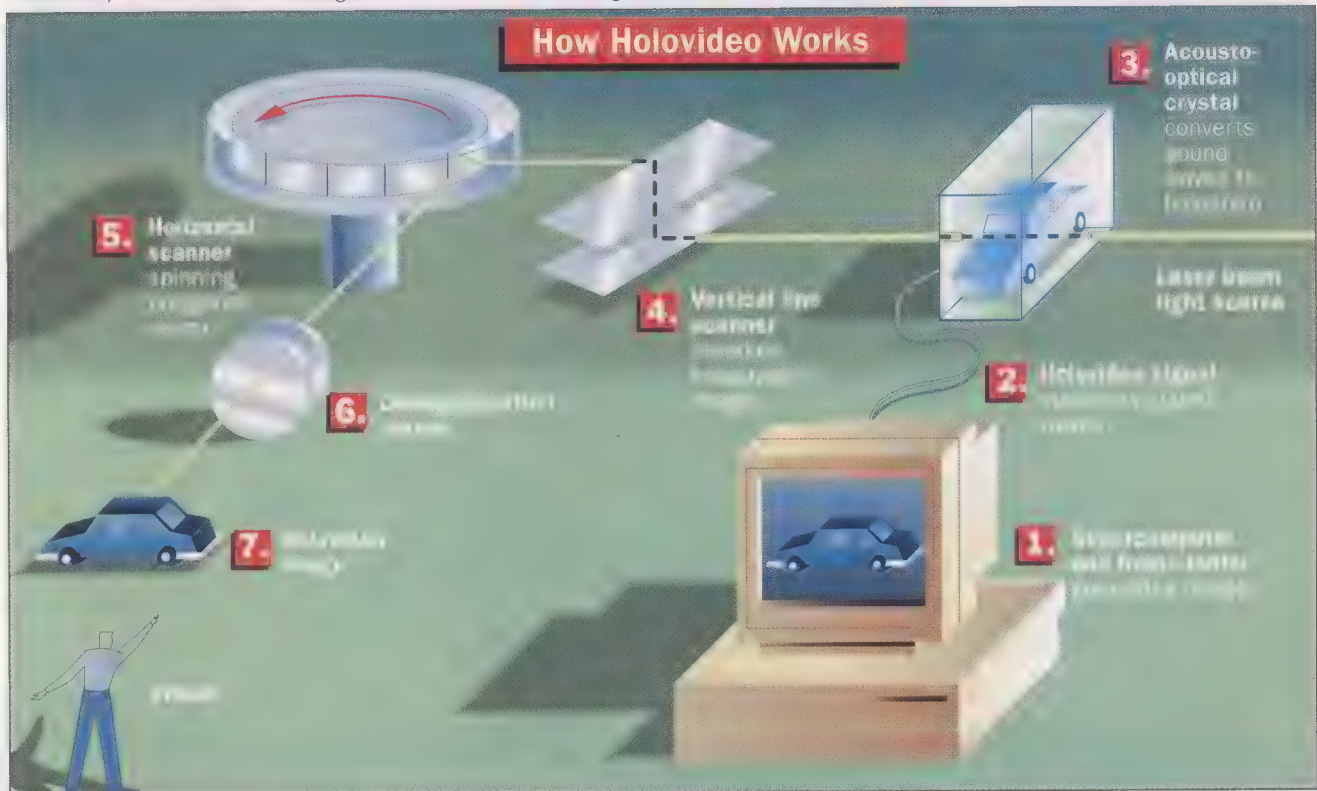
dreds of times finer than photographic film; their resolution has to be much greater.

Second, the CCD in a holographic video camera would need 100 times more pixels than ordinary CCDs. Such a CCD is not likely to appear anytime soon. Even if it does, where would you find a monitor with enough resolution to display the image? Besides, our holographic "video camera" could still only shoot in the dark, and with a laser. What use in the larger world is a camera that can only be used in a laboratory?

The solution, scientists discovered, lies in a less obvious approach. The first step is to stop thinking of real-time holography in video terms and, instead, to think of it as you would a computer graphic. Given the same Honda we've been looking at, what would its holographic pattern look like? High-level ray-tracing provides the answer. In ray-tracing, the computer moves point by point within the volume of an object, adding up the physical contributions from all the other points.

At first glance, this might seem even more daunting than developing a multi-million-pixel CCD. For example, you would need a data rate of 371 gigabits/second to perform the calculations for a hologram occupying a four- by five-inch screen window running at 36 frames/second showing a 3-D scene with 256 gray levels. That's just too much information.

Fortunately, a lot of the data really isn't necessary. At the Media Lab, Mark



DIMENSION



Tomorrow's Reality? Luke Skywalker runs the Princess Leia holovideo in *Star Wars*.

Lucente has spent four years trying to learn what really matters in hologram computations. He and his colleagues, for example, decided the first thing to cut was vertical parallax information. This lets viewers see over and under objects as they move up and down. But most people only move from side to side when they're looking at a display.

Also, since holograms provide more resolution than the eye can see, Lucente decided some of this could go too. After paring the information content to its essentials, Lucente found he (and a helpful supercomputer) could work out the calculations needed to create a hologram in less than a second, and transmit it at video-compatible rates. This was great, if you could find some way to display it.

BUILDING THE HOLOWARE

A holographic display has to have about 16,000 picture elements per inch. This is way beyond existing technology, at least as we're used to thinking about it—as an array of pixels, each addressed electronically. The Media Lab's unconventional solution involves harnessing a relatively mature technology—sound, which is not normally applied to displays.

The Lab starts with an acousto-optic modulator, a small crystal that temporarily changes its refractive index as sound waves move through it. (If you studied physics at school, you may recall that the refractive index measures the ability to bend and scatter light.) Because a hologram is basically a light-scattering device, a change in the refractive index is all you really need to scatter the light to produce the image.

Researcher Pierre St. Hilaire and his

Media Lab colleagues designed and built a system that turns the holographic data Lucente can compute into sound waves. The waves are pumped through an acousto-optic crystal, which turns it into a dynamic hologram by altering its refractive index. The resolution is still coarse, but it's good enough so that the final reduction to the right resolution level can be done with a pair of optical lenses.

From this point on, we can think of the holovideo system as a kind of movie projector. The hologram inside the crystal is the film, and a laser provides the projection or read-out light. Because the sound waves are also moving through the crystal, the hologram is moving too—not the way a moving image moves, but by changing its frame of reference, like a movie projector with a broken shutter. If the light is on all the time, you see each frame skip from top to bottom, and the image makes no sense. To "still" the hologram, scientists use a scanner. As the sound waves carry the laser beam forward, the scanner moves the laser beam back, so the image stays put. Because the data is coming in line by line, a second scanner performs the vertical positioning.

The first holovideo image appeared on a two-inch square display in 1989. Visually, it was only a couple of dots, but it was an amazing sight. Benton says even the researchers on the project didn't really believe it would work until they saw it for themselves. After this breakthrough, the work progressed faster. That original, small holovideo system is now interactive and can project three colors—rich reds, greens and blues. A new, bigger display can work with a four-by-five-inch window.

REAL VIRTUAL REALITY?

Most people interested in interactive, 3-D environments believe they have only one option: stereo. But this means wearing glasses or goggles, or somehow putting your eyes up against a pair of screens. If you don't mind the discomfort, or that your eyes will be focused on a single plane for long times at a stretch, which most people do mind, all you have to worry about is whether you have a decent stock of Dramamine. Most people, it turns out, suffer from cyber-sickness (a sort of sea-sickness) when they use stereoptical 3-D systems. This may be the only option in 1994, but holography is catching up.

It's not that holovideo is ready to hit the market. Far from it. There are serious technical problems still to be defeated. In particular, researchers are having problems moving information to the display stage fast enough, and it's not yet possible to interact with holograms without a time lag. But faster computers with larger-bandwidth datalinks should make these problems go away in the long run.

When the problems are solved, holovideo will have major advantages over the competition, simply because looking at a hologram is more like looking at the real thing. All the depth cues are there. In a stereo system with head tracking, you only get some of the cues. You get binocular disparity, which means that each eye sees a different image; occlusion, which means that objects in the foreground obscure those at the rear; and you get motion parallax, so that you can see different points of view if you move your head (which is accompanied in stereo media by time lag, nausea and headaches).

Holovideo delivers binocular disparity, occlusion and motion parallax, (minus the time lag), plus two other important depth cues: accommodation and convergence. Because your eyes and brain are, in effect, looking at a real object, they can focus naturally at different distances and converge on what interests them. In a stereo system, your eyes and brain are out of sync. You may think you're looking at something near or far, but your eyes are always focused on the screen, and have to remain parallel. Researchers believe holovideo will be far preferable, when it's ready.

But researchers don't expect to have

continued on page 66

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anything to sell for another 10 to 15 years. Even then, holovideos will probably be used for technical purposes: medical imaging, architectural drawings, engineering designs. But in the long term, there's no reason why we shouldn't one day have holographic monitors on our desks, displays that could be used for interactive movies and videogames, holographic phone calls, even fantasy environments. (Yes, we're talking Holodeck here, in a modest way.)

Perhaps a more interesting question is: Where will holovideo images come from? Computer graphics are all very well, but what about people? How will we shoot the 3-D movies of the future? One possibility may involve robotic camera operators. To acquire enough information to calculate a holovideo, a robot might be needed to run five or more holographic video cameras simultaneously. The system would compile all the data, including depth information from a built-in range sensor, into a three-dimensional computer model, the starting point for the holographic portion of the calculations.

Holoconferencing and robot camera operators may sound far-fetched, but most of the needed technology already exists, if only in embryonic form. And it may be here sooner than you think. Just remember that with holography, like video, you can only look, not touch!

TECH TIPS

A cheaper alternative

Rather than buy a little center channel speaker to place on top of a big TV set, I use the preamp outputs on the back of my receiver to let the center channel be heard through the speakers already in the TV.

Andrew Fernandez
La Grange Highlands, Illinois

Elastic reminder

If you use more than one camcorder battery while you are out on location, it's easy to keep track of which ones are used and need to be charged. Just put a rubber band around ones already used. You won't then mistakenly grab a discharged one. You will also immediately know which batteries need to be charged.

Tom Tristan
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anything to sell for another 10 to 15 years. Even then, holovideos will probably be used for technical purposes: medical imaging, architectural drawings, engineering designs. But in the long term, there's no reason why we shouldn't one day have holographic monitors on our desks, displays that could be used for interactive movies and videogames, holographic phone calls, even fantasy environments. (Yes, we're talking Holodeck here, in a modest way.)

Perhaps a more interesting question is: Where will holovideo images come from? Computer graphics are all very well, but what about people? How will we shoot the 3-D movies of the future? One possibility may involve robotic camera operators. To acquire enough information to calculate a holovideo, a robot might be needed to run five or more holographic video cameras simultaneously. The system would compile all the data, including depth information from a built-in range sensor, into a three-dimensional computer model, the starting point for the holographic portion of the calculations.

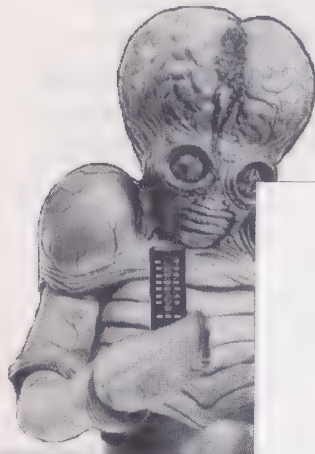
Holoconferencing and robot camera operators may sound far-fetched, but most of the needed technology already exists, if only in embryonic form. And it may be here sooner than you think. Just remember that with holography, like video, you can only look, not touch!

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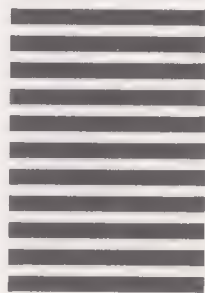
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TAPES & DISCS

N E W R E A S E

FEATURE FILMS

Backbeat

1994. Stephen Dorff, Sheryl Lee; dir. Ian Softly. Surround, cc. (R) 100 min. priced for rental. LD \$34.95. Polygram.

A tantalizing peek at the Beatles' early days, *Backbeat* generates curiously little heat, given the mythic potential of the material. Capturing the future Fab Four in their dues-paying Hamburg period, circa '60-'61, when they were still a quintet, this earnest drama focuses on ambitious John Lennon (Hart) and best friend Stu Sutcliffe (Dorff), who's torn between playing bass with his mates and pursuing a career as a painter. Sutcliffe subsequently falls for arty German photographer Astrid Kirchherr (Lee) and leaves the band as they're on the verge of success, to Lennon's dismay.

The leads try hard in difficult roles. Dorff exudes bohemian charisma as Sutcliffe, but Hart can't transcend the caricature of the angry young man. As a clichéd exotic chick, Lee must make do with knowing smiles and precious dialog. And while *Backbeat* concentrates



Men ■ Work: Fred Ward (left) and Leslie Nielsen, *Naked Gun*'s bomber and his bumbling foe.

on the personal, raising questions about Lennon's sexual orientation, it commits one unforgivable musical crime—minimizing Paul McCartney's contribution to the group. For real thrills, catch the electrifying soundtrack, which features the Afghan Whigs' Greg Dulli, Soul Asylum's Dave Pirner and other alternative all-stars blasting through the vintage songs by Chuck Berry, Little Richard and the like that constituted the Beatles' Hamburg set. —Jon Young

Naked Gun 33 1/3: The Final Insult

1994. Leslie Nielson, Fred Ward, Anna Nicole Smith; dir. Peter Segal. Surround, cc. (PG-13) priced for rental. Paramount.

After two previous *Naked Gun* flicks, plus the *Airplane!* and *Hot Shots!* series, there's nothing remotely original or surprising about *Naked Gun 33 1/3: The Final Insult*. Amazingly, this latest gag-a-thon offers plenty of serious giggles anyway. Thanks to the return of the wonderfully deadpan Leslie Nielsen as hapless Lt. Frank Drebin, the usual manic formula of cheap shots, parodies and low verbal humor works like a well-tuned whoopee cushion.

Having become a househusband who wears fuzzy slippers and bakes fudge, Drebin is coaxed out of retirement to apprehend a bomber (Ward) and his seductive moll (Smith). Of course, the plot simply provides an excuse for any joke that can generate a laugh, which means everything from

witty spoofs of *The Untouchables*, *Thelma and Louise* and *White Heat*, to crude yet hilarious hijinks inside a sperm bank.

In addition to familiar co-stars Priscilla Presley, George Kennedy and O. J. Simpson (providing no distasteful echoes of his real-life situation), good sports like Mary Lou Retton, Pia Zadora, Elliott Gould, Olympia Dukakis and Raquel Welch show up to play themselves in a loony Oscar ceremony that's far more entertaining than the real thing. —JY

Crooklyn

1994. Alfre Woodard, Delroy Lindo, Zelda Harris. dir/co-wr. Spike Lee. Surround, cc. (PG-13) 114 min. priced for rental. LD letterboxed \$34.98. MCA/Universal.

The Inkwell

1994. Larenz Tate, Jada Pinkett. dir. Matty Rich. Surround, cc. (R) 112 min. priced for rental. LD letterboxed \$39.99. Touchstone.

Here we have two childhood reminiscences, from an era of relative innocence and abysmal fashion—the '70s! Lee reveals surprising tenderness in *Crooklyn*, a look at a big family in a crowded, cozy New York neighborhood. Dad (Lindo) would rather make music than money, mom's (Woodard) version of tough love has her shouting, "I'll slap the black off you" and little Tory

EDITOR'S CHOICE

k e n k o r m a n

(Harris, in a star-making debut) is the bright-eyed little girl who learns how fragile her simple pleasures are. A series of comic vignettes at first, the film slowly accumulates story and sentiment, culminating in scenes of love and loss that reaffirm Lee's cinematic command. Even during occasional slow spots, *Crooklyn* struts to a solid soundtrack of soul classics.

Alas, even the music in *The Inkwell* sounds cheesy. The film, which feels longer than it is, explores the black community on Martha's Vineyard. Drew (Tate) is a virginal 16-year-old who's still talking to a doll his late grandma gave him. In a misguided subplot, he's suspected of arson and visits a shrink between efforts to meet girls.

Though billed as a comedy, scenes of *Porky's*-style slapstick fumble. The drama is equally problematic, with turgid dialog and lackluster performances from actors who seem to sense they're drowning in a tearjerker. *The Inkwell* plays like a cheap TV movie you stumble upon during late-night channel surfing. Hit the remote.

—Marianne Meyer



Crooklyn Heights: Tory Harris (center) in Spike Lee's love letter to Brooklyn.

The Wedding Banquet

1993. Winston Chao, May Chin, Mitchell Lichtenstein; dir. Ang Lee. Stereo, subtitled, cc. (R) 108 min. priced for rental. FoxVideo.

The raucously entertaining *The Wedding Banquet* starts simply. Wai-Tung (Chao), a Taiwanese immigrant in New York, has never admitted his homosexuality to his parents, who are

pressuring him from 8,000 miles away to marry. Simon (Lichtenstein), his lover, suggests a storefront marriage to Wei-Wei (Chin), a Shanghai art student living in one of Wai-Tung's properties. The wedding provides her with a desperately-needed green card. But then Wai-Tung's parents come to New York for the ceremony.

From then on, cultures, sexes, languages, generations and orientations crash into each other like bumper cars in hyperdrive. In the wild, vividly detailed title celebration and in the theatrical spectacle of too many people crowded into one brownstone, director Ang Lee demonstrates how a white lie can take on a life of its own and how the best intentions can run amuck. The timing is exquisite, and the players are funny, sympathetic and photogenic. *The Wedding Banquet* is bravura filmmaking and a terrific comedy.

—Sol Louis Siegel

The Accompanist

1993. Romane Bohringer, Elena Safonova; dir. Claude Miller. Surround. (PG) 111 min. priced for rental. Columbia TriStar.

You'd have to look far and wide to find a blander protagonist than Sophie Vasseur (Bohringer), the mousy 20-year-old who's hired by charismatic singer Irene Brice (Safonova) in occupied France, circa 1942. Shy and innocent, the pianist soon finds herself drawn into the privileged but morally compromised world of Irene and her husband-manager Charles (Richard Bohringer), who accepts Nazi patronage with growing misgivings. Vasseur in tow, the unhappily married Brices eventually flee the Continent to London, where Irene pursues a secret romance with tragic results.

But by viewing the Brices and the war solely through the eyes of the naive Vasseur, *The Accompanist* generates surprisingly little dramatic tension. As the

Online services, CD-ROMs, the Information Superhighway: 1994 will either be remembered as the year interactive multimedia finally entered the public consciousness, or as a time when empty rhetoric and hype flourished as never before.

While multimedia's potential is huge, its realities are very limited. Most interactive discs are slow and glitchy, and even the best online services are light on content and heavy on merchandise. Where exactly can one find this sparkling new world of essential information and captivating entertainment? Sometimes in the most unlikely places. The most satisfying multimedia experiences I've had in recent months have come not as



Interactive Blues

I huddled at my computer, but as I sat comfortably on my living-room couch operating a CD-i player via wireless remote control. Introduced a few years ago as the first consumer multimedia machine, CD-i doesn't get much press anymore, but CD-i software has improved to the point where few other systems can hold a candle to it. A new double-disc set called *The Smithsonian Presents the Downhome Blues/Uptown Blues* proves the point.

Downhome Blues/Uptown Blues (\$49.98; Philips Interactive Media, 800-824-2567) introduces the great American musical form through two fascinating half-hour documentaries consisting solely of photographs and narration. In "Blues Basics" sections, current artists demonstrate instrumental styles and techniques. Once they have whetted your appetite, the discs deliver an astounding 74 classic audio recordings by artists like Muddy Waters and Billie Holiday. Whether future multimedia systems employ set-top boxes or cranial implants, this set will serve as a model for interactive content. It's user-friendly, it entertains as it informs, and it expands the horizons of anyone who seeks it out. Now that's a future worth looking into.



Surface Tension: Sophie Bohringer as *The Accompanist*, an innocent in a world of intrigues.

young woman herself admits, life passes her by, giving the narrative a listless, detached quality. Achieving a warped sort of transcendence, Vasseur responds to every situation with the same slack-jawed, uncomprehending state, suggesting a less-colorful forerunner of today's glassy-eyed slackers. —JY

The Paper

1994. Michael Keaton, Glenn Close, Marisa Tomei, Robert Duval; dir. Ron Howard. Surround, cc. (R) 112 min. priced for rental. LD letterboxed. MCA/Universal.

With Hollywood always going for the big score, in money or Oscars, entertaining dramas like *The Paper* don't get made much anymore. Here is the chaos of a New York tabloid's newsroom done to the max. The city editor (Keaton) is pressured by impossible deadlines, office intrigue and a very pregnant wife and former star reporter (Tomei), who wants him to take that job at that prestigious paper uptown. His personal life is actually well-ordered compared to those of the editor-in-chief (Duvall), who may be dying, and the managing editor (Close), who storms around trying to keep the paper from folding.

Ron Howard's biggest asset as a director has always been his ability to field-marshal a lot of characters and subplots. The script by brothers David and Stephen Keopp is a perfect vehicle. It's loaded with incidents, snappy dialog and characters the stars can sink their teeth into. Howard keeps it moving at the breakneck pace of a screwball comedy. He did, however, take the time to make sure the picture's look was as detailed and convincing as the script. While it isn't earth-shaking, or meant to be, *The Paper* is a rousing piece of professional moviemaking. —SLS

A Better Tomorrow

1986. Chow Yun-Fat, Leslie Cheung; dir. John Woo. Mono. dubbed. (NR) 90 min. priced for rental. Republic.

Although he had been making films for over a decade, it wasn't until 1986's *A Better Tomorrow* that John Woo found his metier and reinvented the modern gangster movie. After three years in prison, former Triad counterfeiter Ho (Ti Lung) tries to go straight and make amends with his unforgiving younger brother Kit (Cheung), a cop whose career is tarnished by his relation to Ho. But when the pressures grows too

strong, Ho decides to take on his former comrades with the help of old friend Mark (Yun-Fat), a crippled ex-gunman.

What makes *A Better Tomorrow* unique is the almost romantic level of emotion. Despite spectacular shoot-outs, this is really a story of brotherhood, a status granted by blood (Ho and Kit) or experience (Ho and Mark).

Unfortunately, Woo's film is poorly served by Republic's careless video release. The "full-frame" transfer leaves too much action offscreen, and the English dubbing is at the "Look out, it's Godzilla!" level. Anyone truly interested in Woo should seek this film from one of the mail-order sell-through or rental services that stock Chinese imports, and accept this only as a last resort. —M. Faust

That's Entertainment! III

1994 comp. B&W/color. Gene Kelly, Ann Miller, Lena Horne, Cyd Charisse, Mickey Rooney; wr./pr./dir. Bud Friedgen, Michael J. Sheridan. Surround, some letterboxing, cc. (G) 113 min. priced for rental. LD \$34.95. Collector's edition \$99.98/LD \$124.98. MGM/UA.

Studio execs nixed one of Lena Horne's "Cabin in the Sky" numbers because it was "too risqué to show a black girl in a bubble bath." Esther Williams inherited Johnny Weissmuller's *Tarzan* tank for her aquatic antics. Mickey Rooney does a mean Carmen Miranda impression.



Whipmaster: Lucille Ball in *That's Entertainment! III*

These are just some of the musical factoids which surface in *That's Entertainment! III*, Leo the Lion's latest clipfest. Despite two earlier forays into the vaults there are plenty of gems left, albeit accompanied by a clunker or two. Unlike *Part II*, which wandered into drama and comedy, *III* takes a just-musicals approach, with more behind-the-scenes segments. (See it to believe it: The making of Eleanor Powell's elaborate "Fascinatin' Rhythm.")

My only quibbles: Buffs who are abreast of anniversary and laser editions will have seen several "rare" outtakes before, including "Mr. Monotony" from *Easter Parade* and *Singin' in the Rain's* "Lucky Star" reprise. And the annoying *That's Entertainment* tradition—interrupting a performance for a montage—continues.

Where *III* one-ups its predecessors is in its use of technology. Split-screens pit Joan Crawford against Cyd Charisse in renditions of "Two-Faced Woman," and convey Fred Astaire's precision in versions of a Belle of New York dance that are virtually identical, save for the costumes. And a new Astaire-Rogers pairing is revealed when the *Barkleys* of *Broadway* credits are removed.

Nine hosts glue it all together with minimal puffery, and interesting comments from Lena Horne.

—April P. Bernard

Sirens

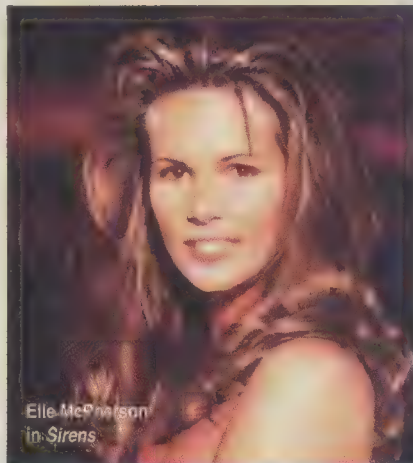
1994. Hugh Grant, Elle McPherson; dir. John Duigan. Surround, cc. (R) 94 min. priced for rental. Miramax.

Few films have the luxury of a market based almost entirely on the skyrocketing values of Hugh Grant's winsomeness and Elle MacPherson's breasts, but the voluminous Q-factor is just a lucky coincidence in the case of John Duigan's *Sirens*. As evidenced by his past work (including *The Year My Voice Broke* and *Flirting*), the Australian writer/director is a master of texture, and those lured to *Sirens* by the lyrical prospect of a skinny-dipping supermodel are more likely to be pleased by the richness of the surrounding company than feel cheated by the slightness of her role.

Utilizing the real-life character of Australian artist Norman Lindsay, *Sirens* tells the languid tale of a "progressive" clergyman sent to persuade

the artist, gruffly portrayed by Sam Neill, to withdraw the more provocative pieces from a forthcoming exhibit. But flung into the deep end of Lindsay's liberated environment, clergyman Campion (Grant) and wife Estrella (Tara Fitzgerald) find themselves or-ches-trating, even participating in, ro-mantic skirmishes between Lindsay's models and the brave locals who dare to socialize with them. The result is some rather bold-print consciousness-raising for the couple, but the real treat of *Sirens* is the twisty path that gets them there.

—John Walker



Woodstock: 25th Anniversary CD-ROM

1994. CD-ROM for Macintosh or MPC. \$59.95. Time Warner/Opcode Interactive.

"It's an even better trip on CD-ROM" reads the promotional materials for *Woodstock: 25th Anniversary CD-ROM*, and the producers of this much-anticipated disc seem to have taken the hippy ethic to heart. *Woodstock* CD-ROM elevates the concept of "light and breezy" to new heights with a scatter-shot approach that touches on a lot of interesting ideas, but never seems to focus—they say attention span is the first thing to go.

Included are performances and interviews from the new "director's cut" video of the *Woodstock* feature film, psychedelic graphics, band bios, excerpts from the newspapers of the time and

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Present at the Creation: Ten Years After in a detail from the *Woodstock* access screen.

more. But it all feels superficial. The "album" sections, for example, only list four titles for each artist, leaving out many watershed releases as well as essential data like the year each record was issued. And most of the news stories trail off after a couple of paragraphs. To its credit, the disc is respectful of the music. Seven complete tunes are included, and when the disc glitches (which is often), it's the visuals, not the sounds, that bog down. So if a splash of color and some groovy tunes for your computer are what you seek, look no further.

—Ken Korman

The Haldeman Diaries: Inside the Nixon White House

1994. MPC or Macintosh CD-ROM. \$69.95. Sony Imagesoft.

The Haldeman Diaries is an engaging new CD-ROM that's both addictive and annoying, at least for this child of Watergate. It's organized into bite-sized morsels of information, so to experience it you must keep asking for more.

There's fascinating material here. Haldeman's narrated home movie clips give you a real behind-the-scenes feeling that's very different from reading text. But there are about 85 of these clips—Nixon dancing, on *The Today Show*, etc. Each lasts between 30 and 60 seconds, but you must keep selecting to see them all. I kept wishing for a "play all" button.

Despite this, I kept getting drawn back in. Clicking on a clip titled "May Day Protest," I hear Haldeman narrate: "This is the May Day demonstration in

Washington, where we arrested the demonstrators. That's John Ehrlichman at his command post on top of the Treasury building." It's an eerie image, for anyone who lived through the Vietnam era. In another clip, we see Henry Kissinger giving an informal press conference on his patio in San Clemente. "Kissinger loved to have press conferences," Haldeman says.

Other elements include still pictures, Haldeman's appointment book and his unedited diaries. But this CD-ROM could benefit from expansion—seeing Nixon prepare for a press conference would be even more interesting if we could see part of the press conference, for instance. But overall, *The Diaries* is compelling stuff. —Cliff Roth

L A S E R D I S C S

Bob Roberts

1992. Tim Robbins, Gore Vidal; dir. Robbins. Digital surround, cc. (R) 102 min. side 2 CAV \$69.95. Pioneer Special Editions.



Like Michael Moore's *Roger and Me*, *Bob Roberts* is a left-of-center movie that makes no concessions—and is all the funnier for it. Writer and director Tim Robbins stars in this mock documentary about a Wall Street trader and folk singer running for the United States Senate. An anti-Bob Dylan cloaked in the flag, Roberts' songs champion greed and bigotry while con-

demning the have-nots. Yuppie audiences cheer this self-styled "conservative rebel," ignoring his shady past and shadier agenda.

Robbins comes down hardest on a subservient news media that thrives on sound bites and buzz words, covering its laziness with a mantle of "objectivity." Aided by a parade of guest stars eager to lend support, Bob Roberts is wildly funny and deadly serious.

While Pioneer's Special Edition laserdisc will be appreciated by fans of the film, it doesn't offer so much that you'll need to trade in your VHS copy. Robbins talks about the difficulties of low-budget filmmaking in a running analog-track commentary, pointing out continuity errors and crew members who double as bit players. A second, CAV disc features production stills, a fuzzy copy of Bob's first appearance on *Saturday Night Live*, and 22 minutes of outtakes, most of which were wisely cut from the film. The exception is a few extra scenes featuring Gore Vidal, who also wrote the liner notes. —M. Faust

Crosby, Stills, and Nash Long Time Comin'

1990. David Crosby, Stephen Stills, Graham Nash, Neil Young; dir. Malcolm Leo. Digital mono/stereo. (NR) 60 min. 1 side CLV. \$29.95. MPI.

The long-delayed laser release of this documentary, previously available as a Japanese import, was timed to coincide with the Woodstock 25th anniversary concert. Writer/producer/director Malcolm Leo has come up with a film that is almost perfect, emphasizing performance material over interviews. Live clips span 15 years and include memorable moments from Woodstock, TV appearances by pre-CSN bands the Byrds, the Hollies and the Buffalo Springfield (the latter, from *The Smothers Brothers Comedy Hour*, is worth seeing just for the vision of Neil Young, circa 1967, hunched over his guitar). Also included is a post

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Woodstock *Dick Cavett Show* appearance by Stills, Crosby and Joni Mitchell, as well as several more recent clips from concerts.

The interviews are nicely structured and informative, and one gets to the end of the film with a really warm feeling for the trio. The only lerdow comes during "Suite: Judy Blue Eyes," which starts out from *Woodstock* and suddenly cuts to a 1990 rendition of the song—in a flash everyone gains 20 pounds (40, in Crosby's case) and the enthusiasm seems forced. Otherwise, this is a fine film, and the disc is well produced, although the chapter numbers are off by one from the labeling.

—Bruce Eder

Bye Bye Birdie

1963. Dick Van Dyke, Janet Leigh, Ann-Margret, Paul Lynde, Ed Sullivan; dir. George Sidney. Stereo, letterboxed. (NR) 112 min. CLV 2 sides. \$34.95. Columbia TriStar.

It was the meow heard around the world. Or at least in New York, where in 1963, *Bye Bye Birdie* uncaged sex kitten Ann-Margret. As Sweet Apple, Ohio's Kim McAfee, she is chosen to bestow "One Last Kiss" on Presleyesque singer Conrad Birdie, who's been drafted.

Under the helm of George Sidney (*Kiss Me Kate*), Birdie delivers when spotlighting the teens, burning up the lines in "The Telephone Hour" after Kim is pinned by Hugo (crooner Bobby Rydell), or cavorting to "A Lot of Livin' to Do" (with Panavision-friendly choreography by *The Music Man*'s Onna White).

And though Birdie lost its satiric edge—and five Strouse-Adams numbers—in the translation from Broadway, its biggest loss was in casting. Amiable Dick Van Dyke returns as a songwriter peddling Birdie's farewell tune, but love interest Chita Rivera is replaced by the abominably miscast Janet Leigh—as "Spanish Rose" DeLeon.

Add a dopey new subplot about a formula called "Speed-Up," and you too may want to kiss Birdie goodbye. But take a look, for a funny turn by Paul Lynde and for this inspiring pledge: "to be...true to Conrad Birdie and the United States of America, both indivisible, with liberty and justice for all."

—APB

Blue Skies/Holiday Inn

1946/1942. Color/B&W. Bing Crosby, Fred Astaire; dirs. Stuart Heisler (*Skies*), Mark Sandrich (*Inn*). Digital mono. (NR) 205 min. CLV 4 sides \$59.95. MCA/Universal.

These two pictures make a natural double-feature. Both star Bing Crosby and Fred Astaire, and both were scored by Irving Berlin. *Holiday Inn*, is the greater of the two films. It is precise in every scene yet gently and memorably lyrical, and bracing in its pre-war innocence. *Blue Skies* has a great title song, a good score, gorgeous Technicolor photography, and one great dance number by Fred Astaire (to "Puttin' On the Ritz"), but nothing as impressive as *Holiday Inn*'s "firecracker dance." *Blue Skies*' Billy De Wolfe does a great comic turn in a key supporting role, but the film's plot and staging lack *Holiday Inn*'s cleverness.

This two-disc set is well-produced, and includes a reissue trailer for *Holiday Inn* but no other extras except for unusually thorough background notes. The transfer of *Blue Skies* is stunning in its richness and detail. *Holiday Inn* doesn't look significantly different from the earlier "Encore Edition" single disc, but now it's chapter encoded and comes with digital sound. Astaire and Berlin completists will need the new edition, but Crosby looks tired enough in *Blue Skies* to make it a secondary choice for his fans. —BE

Godzilla, King of the Monsters

1954. B&W. Raymond Burr, Takashi Shimura; dir. Inoshira Honda. Digital mono. (NR) 80 min. CLV 2 sides \$34.95. Paramount.

Rodan

1957. Kenji Sawara, Yumi Shirakawa; dir. Inoshira Honda. Digital mono. (NR) 70 min. CLV 2 sides \$34.95. Paramount.

Godzilla (or *Gojira*, as it was known in Japan) was the movie that started an entire cycle of Japanese monster movies that succeeded the world over. The original film, however, even in the truncated and edited "American" version released here was a grimly serious movie



dealing with Japan's history as a victim of atomic attack. (All the Raymond Burr footage was shot two years later by B-director Terry Morse and inserted into a heavily cut-down version of the Japanese original.) The special effects have held up well, the story is still spell-binding (though it pays to own the 98-minute Japanese disc, if one understands the language), and the new disc is superior to the old Vestron edition. Flaws in the film are evident, but there's nothing jarring and the sound and picture are sharp for 40-year-old material.

Rodan, about a pair of flying reptiles that nearly destroy Japan, lacks the dramatic impact of *Godzilla*—the narration is properly grim and serious, but there are no central characters to grab onto. It has a healthy diversity of monsters, however (giant insects are a nice touch), and the color doesn't add to the artificiality of the subject. It's more fun than *Godzilla*, and the picture and sound are clean. —BE

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HIGHLIGHTS

Betty

1993. *Stephane Audran, Marie Trintignant, Jean-Francois Garreau; dir. Claude Chabrol.* Suspence, romance, casual affairs, casual betrayal, the downfall of a beautiful woman—old New Wave. Mono, subtitled. (NR) 103 min. VHS only, \$89.95. New Yorker.

Casino Royale

1967. *Deborah Kerr, David Niven, Woody Allen; dirs. John Huston, Val Guest, Ken Hughes, Robert Parrish, Joe McGrath, Richard Talmdage.* Bond comes out of retirement to smash SMERSH but has to deal with jealous, nympho-nephew Jimmy Bond. Music by Burt Bacharach. Mono. (NR) 131 min. Side 3 CAV, LD letterboxed \$39.95. MCA/Universal.

The Gospels, A Multimedia Guide to the Bible

Windows CD-ROM version. Includes nearly one hour of video, an hour of audio, more than 85 illustrations and searchable and printable texts of old and new testaments with instant access. \$49.95. Cinerom.

My Fair Lady 30th Anniversary Restoration: Collector's Edition

1964. *Audrey Hepburn, Rex Harrison, Stanley Holloway, Wilfred Hyde White; dir. George Cukor; wr. Alan Jay Lerner.* THX presentation includes rare footage, documentary, production photographs and drawings, still frames from the original print, portfolio of Cecil Beaton's costume



The Heart Wants What It Wants: Woody Allen finally gets the girl in *Casino Royale*.

designs, CD of Frederick Loewe's score, more. Stereo. (G) 173 min. LD letterboxed \$129.98. FoxVideo.

Sid and Nancy

1986. *Gary Oldman, Chloe Webb; dir. Alex Cox.* Mythmaking biopic about the love-and-death-duo who brought a tragicomic, ha'penny opera end to the punk world as we knew it. Commentary by Cox and screenwriter Abbe Wool, punk archival footage and stills. Stereo. (R) 111 min. LD \$99.95. Criterion.

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Overview of world history documenting the economic, political, spiritual, moral and cultural heritage of mankind. CD-ROM contains both DOS and Windows versions of complete text of Will and Ariel Durant's 11-volume book history, plus 30 minutes of full-motion video, 800 photos, maps, drawings and paintings, with instant access to all. \$99.95. World Library.

3 Chains O'Gold

1994. Formerly Prince; various dirs. 11 video clips from his platinum album (the one with the funny squiggle for a title) tied together with story. Videos include "My Name is Prince"??????? Stereo. (NR) 72 min. VHS \$19.98. LD \$29.98. Warner Reprise.

Winter Light

1962. *Max von Sydow, Ingrid Thulin, Gunnar Bjornstrand; dir. Ingmar Bergman.* Suicidal man turns to priest who can only offer his own confusion over a seemingly meaningless existence. Why didn't Sondheim try to turn this into a musical? Mono, subtitled. (NR) 80 min. LD \$49.95. Criterion.

Wargames

1983. *Matthew Broderick, Ally Sheedy, Dabney Coleman; dir. John Badham.* The film that launched a thousand hackers (minimum), finally gets the big surround/widescreen laserdisc treatment every science-fiction masterpiece deserves.

continued on page 108

By Josef Krebs

Labels For Less

I Was a Male War Bride



Those easily overcome by music and romance will not be able to resist the offers they'll be getting from the big labels this month. Six Rogers and Hammerstein movies are being packaged by FoxVideo with an audiocassette of their soundtracks—*Carousel, South Pacific, The King and I, State Fair* and *Oklahoma*, priced at \$19.98 each, and *The Sound of Music* going for \$24.98. Similarly from MGM/UA, *Meet Me in St. Louis* and *Ziegfeld Follies* will each be accompanied by a CD of their respective soundtracks for \$29.98 (\$19.98 without the CD). Also from MGM/UA, for the first time at \$14.95 each, *An American in Paris, Brigadoon, Gigi, High Society, Seven Brides for Seven Brothers, Show Boat* (1951) *That's Entertainment, That's Entertainment II, Annie Hall* and *The Russia House*. FoxVideo will be sending Cary Grant to seduce you in *People Will Talk* and *I Was a Male War Bride*, each \$19.98, while MCA/Universal hopes your hearts will be overcome by Marlene Dietrich in *Angel, Desire* and *Seven Sinners*, each at \$14.98. People seeking romance are at the heart of *Desperately Seeking Susan, Hannah and Her Sisters* and *The Woman in Red*, each \$14.98 from Orion, while *Passione D'Amore* can be found at Kino (along with *Vagabond* and *Open City*), \$24.95 each). Ultimately, though, as Republic reminds us, romance will only come along at \$14.98 if you are among the very *Young at Heart*.

—JK

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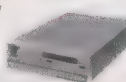
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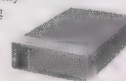
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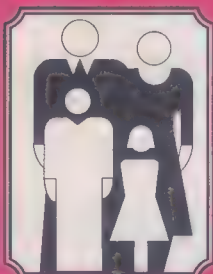
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HOLIDAY GIFT GUIDE



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Why Don't You Do It?

At NBO "Name Brands Only," mail order Satellite TV and Home Theater are not only a specialty, but toll-free expert technical assistance is also available to those who want to install it themselves. NBO has been selling satellite TV systems and home theater, including satellite programming, at discount prices since the early '80s and has helped many thousands of customers install their own systems. And now 40 percent of NBO's current business comes from referrals made by satisfied dish owners.

In addition to NBO's larger 90-inch full-view satellite TV systems, and as part of the new RCA 18-inch DSS (Digital Satellite System) nationwide roll-out, NBO is now offering the new 18-inch DSS package to its customers. The experts at NBO can point out the distinct advantages of both systems as each will appeal to different people. For instance, 90-inch full-view systems offer more sports with more than 100 free channels and more than 20 satellites from which to choose. The 18-inch DSS, on the other

hand, is slightly more affordable to purchase, is smaller and offers many more pay-per-view movies and even features CD radio with many digital music selections. Both systems provide laserdisc quality video and audio.

For the holiday season you'll want NBO's Satellite TV Home Theater Discount Catalog with its many gift ideas for making home entertainment more enjoyable. There is even a complete listing of all the available satellite programming. You can receive a free copy of the NBO catalog by calling 1-800-318-DISH (3474). NBO has helped thousands successfully install their own home theater systems. Let NBO help you too! Reader Service #132.

Ready, Aim, Cut!

The JVC GR-SV3 Compact VHS Video Entertainment System is an all-in-one VCR, video camera, and television (with optional tuner), featuring video messaging with a totally new design concept. Boasting a versatile color LCD screen, the JVC Systemax offers new





video applications and fresh perspectives.

The Systemax is a complete entertainment system that transcends mere recording to become a focus of creativity due to its versatile multi-purpose Color LCD Swing Monitor. In its lowered position, the LCD monitor provides unique "feedback." The Interface Shooting Position puts everyone in front of the lens with an opportunity to join in the fun of video making. Alternately, the LCD monitor can be raised into an upright position, facing the user, to serve as an extra-large viewfinder – showing everything in full color.

The handy Video Message function is a built-in video answering machine. A green LED indicates that a message is waiting and a press of a button starts video playback. Also, with the optional tuner, the Systemax transforms into a portable television.

In addition to the monitor, there are several features that enhance the overall simplicity and convenience of the Systemax, such as QwikPix, which ensures that each "take" is 5 seconds long. The lively tempo of images and scenes makes home videos look as good as if they were made professionally. Other features include Instant ReShoot, Seek, 3x Power Zoom, LCD Status Panel, Auto Date and A/V Input/Output Jacks, for dubbing and editing convenience. The biggest convenience

in using the Compact VHS system is that compact cassettes can be played back on a VHS video deck using a VHS Playpak.

For more information, call JVC at 1-800-252-5722 or use Reader Service #133.

Perfect Video Mate

New from Goldstar U.S.A., Inc. is the unique VH8™/VCR dubbing deck, the GVR-DD1, a fully integrated, combination 8mm and 5-head VHS VCR – a perfect gift idea for 8mm camcorder owners.

Goldstar's VH8™ allows consumers to instantly play back 8mm tapes via the VH8™/VCR dubbing deck rather than using their camcorder as a playback vehicle, which places undue stress on the camcorder's delicate head and transport systems.

The new VH8™/VCR dubbing deck also allows consumers to copy 8mm tapes onto full size VHS format tapes with the touch of a button – so 8mm camcorder owners can share the excitement of birthdays, holidays, sporting events and baby's first steps, with friends and family.

Even more important news for camcorder owners is the dubbing deck's most advanced, easy-to-operate and most requested editing functions that allow amateur video-

graphers to achieve professional looking results every time. Features include: a variety of editing options including an assemble editing feature that allows consumers to easily remove unwanted footage, an edit switch function; front audio/video in-jacks for quick and easy connection to alternative audio or video sources and a video dubbing function; one touch copying from 8mm to VHS, with just-fit recording; normal 8mm or high band (Hi8) videotape playback at normal resolution; four video heads; a flying erase head for eliminating picture noise during editing; and jet and logic search.

Goldstar's VH8™ is currently available at better electronics stores nationwide for a manufacturer's suggested retail price of \$899 or use Reader Service #134.

New Energy Home Sound

If the Energy Loudspeaker brand is new to you, don't feel bad. Energy is one of the fastest growing audiophile quality speakers in America. And for this holiday season, Energy offers the best quality in sound and performance in home theater systems.

The RVS (Reference Video System) is the Energy home theater system for the buyer who wants Energy's best. It

comes in a high gloss black furniture-grade finish. The system's five pieces are made up of left, center, and right channels plus a pair of RVSS effects speakers that total \$1600. On top of which you could add one or more of the Energy AS-90 or AS-180 Powered Subwoofers (90 and 180 watts, \$550 and \$750 ea. respectively).

Energy's latest entry in home theater, the HTS-1 loudspeaker system featured here, has much of the technology developed for the RVS System. Innovations such as "point source" driver arrangement give more accurate and precise



spatial information crucial to realistic home theater. Three HTS-1 speakers mean that the front hemisphere of sound is spectrally balanced, so as the jet plane flies across the screen and beyond, it does not change its sound character from one speaker to the next ruining the illusion.

With a suggested retail price of \$250 each, the HTS-1 speakers make possible an excellent sounding five piece system for under \$1000. And as your fortunes improve you can further improve your system by adding one or more of Energy's powered subwoofers – assuming of course you also want to





HOLIDAY GIFT GUIDE

activate the nearest Richter Scale! Enjoy!

Energy Loudspeakers is located at 3641 McNicoll Avenue, Scarborough, Ontario, Canada. Call 416-321-1800 or use Reader Service #135.

Video Out Laser In

Laserdiscs are becoming more and more popular as consumers realize they are not getting the most for their dollar when they buy and rent videos. Laserdiscs have more footage, uncut, unedited, director's cut, widescreen movies than its predecessor, VHS. And for the real videophile, laserdiscs offer incomparable audio/video quality that VHS cannot provide.

Laserdisc Fan Club, Inc. provides consumers with a wide

suit '94 (uncensored!), *The Fugitive* (WS), *The Pelican Brief* (WS), *The Three Tenors* (Dodger Stadium), and *Pioneer LaserKaraoke Christmas Songs Vol. 1 & 2*.

The limit is two discs per title and the offer expires 12-31-94. Just announced, the '94 summer blockbuster hit *Speed* will be available in THX, widescreen on November 15 with a 15% discount off the suggested retail price of \$29.95! If none of these titles grab you, call for their free monthly catalog.

The Fan Club offers free membership and an informative monthly catalog with hundreds of new and recent releases in each one. Every title is discounted up to 40%, free UPS ground shipping and they are open 7 days a week, weekdays 7-7, weekends 8-5 (PST).

Call the Laserdisc Fan Club at 800-801-DISC (3472) Dept. V114 or use Reader Service #136.

march across the screen like tickertape, and flash on and off. Wipe, scroll, and tickertape functions offer a choice of three speeds.

Character options include upper/lower cases, two fonts,



four sizes, three borders, and eight colors. Lettering has been included for Spanish and French as well as English.

The V-6350, which is Hi8 and S-VHS compatible, stores up to 10 pages in memory. Playback of stored titles can be made manually or automatically. The V-6350 has a suggested retail price of \$299.

For more information, call 800-231-0031 or use Reader Service #137.

Write Your Titles Right

Creativity is virtually unlimited with the Ambico model V-6350 Video Title Writer, a color titler with dozens of options and effects to enhance any video production.

Although sophisticated in design, it's easy to use as all capabilities of the unit are illustrated in a built-in "demo" program and there are on-screen displays during operation. Created titles can appear over live video or on internally generated color backgrounds. They can cut in and out, wipe in and out in a variety of ways, scroll up and down the screen,



spectrum of laserdiscs enough to fill your home library. And now, for a limited time only, Laserdisc Fan Club is offering VIDEO Magazine readers a 20% discount off the suggested retail price on these great titles: *Jurassic Park* (THX, WS, CAV or CLV), *Schindler's List* (THX, WS), *The Flintstones* (THX, WS), *The Paper* (WS), *Sports Illustrated Swim-*

Making Video Magic

Studio Magic is the next step in multimedia. Video production sequencing, once only the domain of expensive professional studios, now comes to the desktop computer for



affordable home and business creative uses.

Studio Magic lets you display VGA images on any TV screen — and it can capture full-size, full-color, still images and store them on disk for use in multimedia presentations or desktop publishing. It allows you to connect two video sources as input, then add computer graphics, sound and special effects for final output to your videotape or television set. But its greatest power is its on-line video production studio which lets you create sequenced and visually enhanced videotapes.

It is literally a videotape production studio in a box.

It requires an available slot in an IBM PC-compatible computer with 386/25 MHz and up. M.S.R.P. is \$499.95.

For more information call 408-378-3672 or use Reader Service #138.

JVC Leaps Into '95

For 1995, JVC introduces the Premiere Series — an advanced line-up of televisions destined for critical acclaim. Why? Because they have all the makings of stardom...featuring new technology that not only makes them easier to operate but improves upon both picture and sound. From the high-quality 20" stereo Premiere model to the incredible widescreen 55" projection television, every night can have the excitement and thrill of an opening night with JVC Premiere Series Televisions.

The flagship of the Premiere



Series Direct View Models is the AV35BX5. To control the many features on this set, JVC developed the Super Command universal remote control and an impressive menu system. Super Command is a whole new way to operate a TV. Super Command is a total heads-up system, using 4-way Cursor Control to move the operator through the menu with ease. JVC has also included a HELP button on the remote to assist consumers with feature definitions and step-by-step operating instructions. Super Command is easy to understand and operate. Another new Super Command feature is Hyper Scan high-speed channel change. Channel surfers will love to zoom up or down at five channels per second.

This multi-faceted television also features a dark tint tube with an Invar shadow mask coupled with Black Level Expansion, Wide Band Comb Filter, Video Noise Reduction and Velocity Modulation allowing for the brightest, most vivid pictures. The theater-like sound is made possible through Digital Sound Processing that has six distinct modes: stadium, concert hall, jazz club, theater, game and mono. Also included with this model is a set of cordless headphones for a more personal listening experience.

Not only has JVC improved picture quality, sound and con-

venience, it offers some unique features such as the 6-PIX picture-in-picture and full-motion, normal proportion split screen. The 6-PIX feature allows the user to simultaneously view the action on six pre-designated channels in order to determine viewing preference. The full-motion, normal proportion split screen displays two equal sized 17" pictures.

For the most convenient home theater system, JVC offers AV CompuLink which links your JVC home theater components together for one-touch home theater. JVC's Premiere Series Televisions bring consumers the most in advanced technology, including the best in picture quality, sound reproduction and user-friendly operation for your Home Theater System. For more information about the Premiere Series, call JVC at 1-800-252-5722 or use Reader Service # 139.

Superpower Subwoofers

Cerwin-Vega, the renown family-owned and operated loudspeaker company, introduces two new remote-controlled powered subwoofers, the HT-10PWR and the HT-12PWR, to its Sensurround Home Theater line.

Both the HT-10PWR 10-inch with a 100-watt built-in amplifier and the HT-12PWR 12-inch with a 150-watt built-in amplifier have convenient remote control capabilities — a welcome option for managing the often drastic bass variance

in soundtracks and music. For additional convenience, the wireless remote's infrared volume control code is compatible with all universal remote controls.

Although Cerwin-Vega's Sensurround powered subwoofers were designed as components for home theater applications, they integrate perfectly into high-end audio music systems. They are also ideal for use with A/V receivers lacking "subwoofer out" jacks — by connecting the receiver's speaker outputs to the subwoofer's high level inputs for superb sound performance.

The frequency response for both products is rated at 30Hz – 150Hz, ±3dB. They feature vented cabinet designs covered in black wood-grain vinyl with black knit speaker grilles and may be placed vertically or horizontally.

The suggested retail price on the HT-10PWR is \$800 and the suggested retail price of the HT-12PWR is \$900. For more information, call Cerwin-Vega at 805-584-9332 or use Reader Service #140.





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AudioQuest Knows

As a bunch of cheapskates, the folks at AudioQuest have always been fixated on value. As a result, AudioQuest continues to specialize in the parts of audio and video systems where the least money can make the most difference.

The many products offered by AudioQuest have come after fourteen years of hard work, lots of R & D, and lots of fun using the results. Whatever price range you consider, you will find that AudioQuest offers the most cost effective ways to enhance the performance of your entertainment system.

So, in order to avoid acquiring any more ugly ties, please drop those helpful hints early—this year you would really appreciate something from AudioQuest.

For more information, call AudioQuest at 714-498-2770 or use Reader Service #141.

OmniSource™ 10•12

Lenmar® Enterprises Inc. of Westlake Village, CA, has the most complete full-size camcorder battery charger/reconditioner available in one pack-

age. It charges your VHS or VHS-C camcorder battery rapidly at home or in your car.

The OmniSource™ 10•12 will quickly discharge/recondition nickel cadmium batteries to eliminate “memory” effect, and then automatically charge the battery. For NoMEM® batteries it has a “Rapid Charge Only” option.

It is designed to charge most 9.6V, 10V and 12V camcorder batteries; including Panasonic, RCA, Hitachi, JVC, Sharp, Quasar, Magnavox, Goldstar and Minolta.

Whether you are looking for a more versatile charger, a hard



to find replacement or an extra charger, the Lenmar® OmniSource™ 10•12 will power your needs. Lenmar model BCR10 has a suggested list price of \$89.95. Call Lenmar at 800-424-2703 for a free catalog on the OmniSource 10•12 and their full line of Camcorder Performance Products or use Reader Service #142.

Getting the BIG Picture

Deriving the maximum entertainment value from high performance video and home theater sources, Pioneer Electronics continues to offer its complete line of “cinema-wide” system rear projection moni-

tors, the SD-P5575, SD-P5075, SD-P5073, SD-P4575, SD-P4573 and SD-P4571. Each model allows users to view a greater amount of video information from conventional NTSC programs, offering a more authentic, theater-style experience.

To enhance the viewing experience, the 75- and 73-series include a digital zoom feature, which provides consumers with the option of watching movies in either a “normal” or “full-cinema” viewing mode. The normal mode maintains the recorded aspect ratio, while full-cinema mode expands the vertical picture information to better fill the screen. For instance, a movie recorded in the letterbox format played in full-cinema mode can be viewed with minimal black bands at the top and bottom of the screen.

Round out your home theater system with the visual excitement of a Pioneer projection television. For more information, call Pioneer at 1-800-PIONEER or use Reader Service #143.



XLO/VDO Cables

XLO/VDO™ is a complete line of cables for home entertainment, and includes every audio, every video, every digital, and every loudspeaker cable that could ever be needed for even the most complete Home Theater System.

All XLO/VDO cables are designed to work properly with your other components and with each other, to allow you to enjoy all the performance, all the dynamics, and all the sheer fun your system is capable of delivering.

Three speaker cables are included in the XLO/VDO lineup, each designed for best performance in its own particular application: ER-11 is a modestly — priced cable for front and center speakers that offers outstanding clarity and definition across the full frequency spectrum, and providing the kind of dynamics and spatial characteristics that make good Home Theater great!

ER-12 is a 9-gauge (in "Shotgun" mode) cable for subwoofers, or, because it allows single cable bi-wiring, for connecting higher performance front and center speakers. On fronts and centers, it's amazing, and for subwoofers, it'll produce (providing your woofers are up to it) the kind of clean, taut, bass that will crack walls.

ER-14 is specifically designed for scale and rear channel applications. Like all other XLO/VDO cables, it's very modestly priced, but one major Hi-Fi magazine reviewer, running it full-range on the main speakers of his Reference Sys-

tem, pronounced it to be the very best speaker cable he had ever tried, regardless of price.

For more information or the name of the dealer nearest you, contact XLO Electric Company at 909-466-0382 or use Reader Service #144.

Ultra-Fidelity Home

Now, discerning film viewers can experience the sonic realism and clarity that tens of thousands of uncompromising audiophiles enjoy from their music systems. For almost twenty years, Vandersteen Audio has been an acknowledged leader in the design of high-fidelity loudspeakers. With their vast experience, they understand that despite the current popularity of small speakers, only full-size, high-performance loudspeakers can properly reproduce the complex, wide-range information of a film soundtrack.

The seven speaker Vandersteen home theater system uses a pair of full-range front speakers, two amplified subwoofers, a unique center speaker and a pair of wide-range surround speakers. Any of Vandersteen's floor-standing, full-range models can be used as the main front speakers. They all share the high-technology Vandersteen boxless design that eliminates the baffles around the drivers for enhanced openness and clarity. The 2W subwoofers

each have an integral 300 watt amplifier with innovative feed-forward error correction circuitry. The three drivers in each subwoofer combine the high cone speed of 8-inch drivers with the large cone area of a 15-inch driver for powerful, detailed bass. The magnetically shielded VCC-1 center speaker is perfectly matched to the unique requirements of the center position. Its coincident, co-axial driver avoids the response variations that plague conventional center speakers. Vandersteen recommends that one of their floor standing models or their new VSM-1 in-wall speaker be used in the surround positions. This ensures that the surround speakers are perfectly voiced to match the front speakers. All the speakers in the Vandersteen home theater system are aligned and phase-correct to maintain the dimensional characteristics of the original sounds. The Vandersteen system surrounds you with dynamic, crystal-clear sound that transforms your living room into the film location.

Complete seven speaker Vandersteen ultra-fidelity home theater speaker systems, including two amplified subwoofers, are priced from under \$4400. For more information, call Vandersteen Audio at 209-582-0324 or use Reader Service #145.



Digital Hollywood

Digital Hollywood Entertainment is your best source for mail order laser discs in the business. They offer great prices, great customer service, a fantastic sales staff, and a great selection of laser discs. In fact, they carry over 6,000 titles to choose from.

Call them for updated new release information and for their great sale prices. All new customers will receive an extra 3% in addition to their standard 15%. This offer is only good on the initial order. Act now and receive a total of 25% off on *Jurassic Park*. This offer lasts through the end of October, so don't delay.

Digital Hollywood Enter-



tainment will help you make it through the holiday season with great laserdiscs that will make any person grin from ear to ear.

Digital Hollywood Entertainment can be reached at 800-944-DISC or at Reader Service #146.

Holiday Thumbs Up!

You'll shoot some great video this holiday season. But the great moments will be mixed in with footage you'd rather forget. Now, with the Thumbs Up

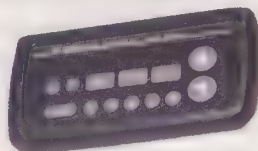


HOLIDAY GIFT GUIDE

home video editor, you can easily cut out the unwanted footage and save only the best!

Thumbs Up is easy to use. Just press the "thumbs up" button to mark the scenes you want to keep. Press "thumbs down" to mark the scenes you don't want. Then sit back while Thumbs Up records only your best and leaves the rest behind — automatically!

With Thumbs Up, you can make holiday videos you'll be proud to show to your friends and family.



For more information on Thumbs Up and other Videonics products, call 1-800-338-EDIT, or write 1370 Dell Ave., Campbell, CA 95008 or use Reader Service #147.

Azden's WR2-PRO

Want to use two wireless microphones at the same time when you're shooting a video? The Azden WR2-PRO is the only on-camera two channel discrete wireless receiver on the market. In addition to the receiver, you need two mics, and they can be on lavalier (WL/T-PRO), and one handheld (WM/T-PRO), or two of the same type. This VHF system uses the same two frequencies as the other Azden "PRO" series mics, and has a range of more than 250 feet.

For more information on Azden products, call 800-247-4501 or use Reader Service #148.

State of the Art

AMC's System 2 can easily turn your A/V components into an extraordinary home theater. System 2 is comprised of a professional edition Dolby Pro Logic preamplifier, two audio-ophile-quality amplifiers and a unique powered subwoofer.

System 2 is flexible and powerful enough to allow you to use your existing speakers or add new speakers as needed. System 2's preamplifier has built-in special calibration circuits allowing you to balance all six speakers' sound pressure level to within 1 dB of each other.

In creating System 2, AMC's first design priority was to engineer a professional edition Dolby preamplifier that guarantees every movie soundtrack is reproduced without distortion. Although this might seem obvious, these distortions are actually commonly found in entry-priced home theater components.

The ultimate result is that with System 2, you can play your favorite films' soundtracks in state-of-the-art Dolby Pro Logic or, when needed, offer decorrelation for stereo signals.



The System 2 preamps will be upgradable to THX-controller status or can be purchased with THX-ready controls.

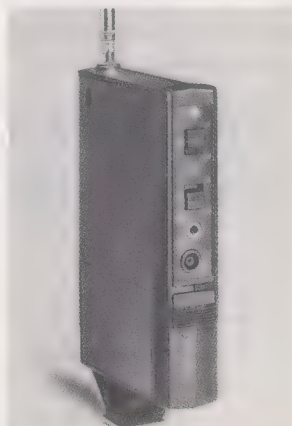
For more information, contact AMC at 1-800-321-6396 or Reader Service #149.

High-Tech Musicians

Desktop Music presentation specialist Edirol Corporation has opened up new ways to interactively enjoy music with a computer, whether the user can play a traditional musical instrument or not.

The company has launched a direct marketing program to provide "bundled" music software and high-quality sound synthesizer cards and modules designed to be connected to a computer. These user-friendly packages put almost anyone into the "virtual music producer's seat." This music can be printed, played or recorded onto video presentations.

Edirol Corp. is a division of Edirol International which is a worldwide corporation providing software and hardware for music enthusiasts. For more information, call 1-800-380-2580 or use Reader Service #150.



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TVs



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JVC



RCA

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EDITING

VIDEONICS

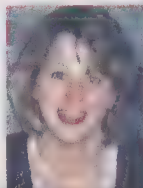
A great combination: MX-1 Editor/Mixer & TM 2000 Titler

Panasonic

A new star combination: WJ-AVE7, and the WJ-AVE1 Titler



"I bought my friend's VCR and camcorder from Powervideo. Not only were the prices great, but the people were very helpful with which items would work best for us. They even delivered everything the next day, just in time for his birthday!"



VCRs



JVC Jog Control with Hi-Fi Stereo

HR-S6900, HR-S4900, HR-VP710, HR-VP618



SONY Industrial Hi-Fi Stereo SVO-1410, SVO-1610



TOSHIBA

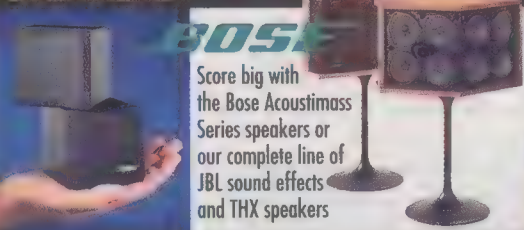
Hi-Fi Stereo M-650, M-660, M-760



Panasonic

Hi-Fi Stereo PV-S4480, PV-S4366, PV-4462

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PVIQ504	Call	GRAX37	Call
PVIQ604	Call	GRAX70	Call
PV54	Call	GRAX75	Call
PVS64	Call	GRSZ7	Call

Canon		SHARP	
			
ES1000	Call	VLE30	Call
UCS5	Call	VLH400	Call
		VLL63	Call
RCA		TICOH	
			
CC547	Call	R17C	Call
PRO843	Call	R16	Call
PRO845	Call		

VHS VCR'S			
JVC		Panasonic	
			
HRS6900	Call	PVS4480	Call
HRS4700	Call	PV4464	Call
HRVP710	Call	PV4462	Call
HRVP618	Call	PV4461	Call
HRVP612	Call	PV4451	Call
HRJ610	Call	PV4401	Call
HRJ410	Call	PV2401	Call

GO VIDEO		RCA	
All Models..		All Models..	
PIONEER Laser Disc			
CLDD703	Call	CLDV820	Call
CLDD503	Call	CLDV720	Call
CLDM403	Call	CLDS303	Call
CLDA100	Call	CLDS201	Call

A/V Receiver		Home Speakers	
JVC, KENWOOD, PIONEER, TECHNICS & OTHERS		BOSE, INFINITY, ADVENT, PINNACLE	
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Forest Hills, NY 11375

LCD FACE-OFF

continued from page 51

so limited. Only the Sharps offer manual override of the autofocus—and that's only accessible via an onscreen menu.

The FX730V came out best in our autofocus test, locking in after a slight bit of focus hunting (pulsing back and forth in search of the correct setting) under both normal and low-light conditions. The 8mm ViewCam takes a little more time to focus than the Sony, but also locks in after a few seconds, even on medium-contrast subjects in low light.

The Hi8 ViewCam's autofocus, however, has an unfortunate tendency to hunt, especially on medium-contrast subjects and/or in low light. If it can't lock in on a focus after about 15 seconds, it will actually zoom out until it can! Suffice it to say that none of the participants considered this feature beneficial.

Neither of the fixed-focus camcorders we reviewed did especially well with nearby objects when their zooms were engaged. At six feet, the focus on both the Snap and the SystemMax was decidedly soft—which couldn't always be discerned by viewing through the LCD, especially in low-light or bright sunlight situations.

BATTERY LIFE

The most significant fact our battery tests proved was just how much the LCDs cut battery life. The camcorders we could test with the LCD screens both on and off showed, across the board, a significant increase in battery life when the LCDs were not engaged—anywhere from half again as much in the case of the FX730V, to nearly double for the Snap. Neither of the ViewCams allow the option of switching the LCDs off, which is logical, as both lack a second viewfinder.

The results can be seen in the accompanying chart. In all cases, our battery test results were higher than

BATTERY LIFE CHART (IN HOURS/MINUTES)		
CAMCORDER	LCD ON	LCD OFF
SHARP HI8 **	1:21	NA
SHARP 8MM *	0:59	NA
SONY SNAP! *	0:39	1:12
SONY FX730V **	1:17	1:56
* 1-hour rated battery ** 2-hour rated battery		

those listed in the camcorders' operating manuals. It should be noted, however, that our battery test did not

include engaging the autofocus or zoom lenses, or shooting under variable lighting conditions.

With the exception of the Handycam Snap, which uses a lithium-ion battery, all camcorders come with NiCad batteries. Both the Sharp Hi8 and Sony's FX730V come with the larger, two-hour rated battery, while the Sharp 8mm and the Snap come with one-hour rated batteries.

FEATURES AND ERGONOMICS

We'll go through this section by camcorder, starting with each model's features, followed by a look at its ergonomics, then overall impressions by the panel. We should note that all the camcorders require a viewing hood for use in bright sunlight; it's an extra-cost option on all but the Snap.

- **Sharp Hi8 VL-H400U:** 8x zoom, autofocus with onscreen manual override, programmed auto exposure modes, shutter speeds to 1/10,000-second, auto white balance with lock, backlight compensator, electronic image stabilization, letterbox-style 16:9 mode, digital effects (still, strobe and fade), external mic and headphone jacks, and S-video/video/stereo audio input/output jacks, four-inch LCD monitor and infrared remote.

This was the largest and blockiest camcorder tested. Brent, Janeen and I found it difficult to hold steady while shooting for long periods of time. I also noted that the swivel unit housing the lens was especially vulnerable to tipping when I used either the record switch or the zoom, which are directly behind the lens. Stewart, however, felt it was "the most comfortable to hold and shoot, by some distance, of all the camcorders." Even panel members who complained about the size and weight had to admit it was ergonomically friendly.

"In terms of design," Stewart commented, "this is my dead-on favorite. If it wasn't for the image quality, this would be my first choice in a consumer-type camcorder." Brent more-or-less concurred, referring to the H400U as "a very workable design marred by a so-so picture." He liked the fact that it had mic and headphone jacks, and thought that "the digital effects are kind of fun" and that the "big screen would be great for watching movies on 8mm tape."

- **Sharp 8mm VL-E36U:** 8x zoom, autofocus with onscreen manual override, programmed auto exposure modes, auto white balance, backlight compensator, external mic and earphone jacks, A/V output through 1/8-inch jack, three-inch LCD monitor and infrared remote.

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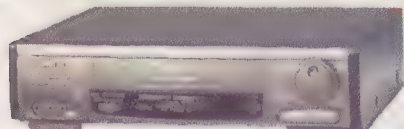
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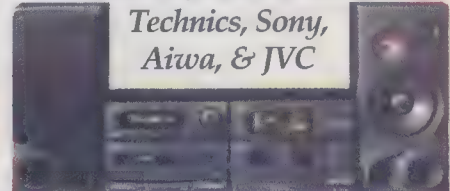


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lar than its Hi8 sibling, this ViewCam earned high marks from panel members who found the H400U difficult to use. Janeen remarked that it was "easier on my arms than the Hi8...fits my hands much better, and is much lighter." Brent commented on its "great feel" and called it "much more comfortable than the Hi8." I felt that the smaller, lighter ViewCam also had a more stable swivel lens housing. While it was easy to pivot if desired, I didn't feel I would knock my shot off-balance every time I went to record or zoom. Stewart disagreed. "I found it too small for my grip," he said. "It didn't feel as comfortable or pleasurable to hold."

"A no-hesitation recommendation for fun, casual shooting," said Brent. Stewart, however, "felt it wasn't as nicely finished as the Hi8 version. It doesn't have the same beautiful feeling of design inevitability that I get from the H400U." Even so, he praised this model for its tape carriage mechanism, calling it "less awkward to access than the side-loading Hi8," and its external mic and headphone jacks. "These are definite positives," he stated.

• **Sony CCD-FX730V:** 12x zoom, autofocus (no manual override), programmed auto exposure modes, auto white balance, backlight compensator, external mic and headphone jacks, video/stereo audio input/output jacks, LANC edit control jack, three-inch LCD monitor that switches on when folded out, black-and-white viewfinder and infrared remote.

"This looks like a conventional shoe-type camcorder," Lance pointed out, "unless you open the LCD monitor hinged to the front of the left side." It has "a solid feel to it," said Stewart,

adding that "the controls are straightforward, and will be familiar to those who have used a Sony before. Janeen, however, could not reach the zoom comfortably, and felt it was too heavy. "My right hand is too small to hold the camcorder with ease," she said.

Stewart, Brent and I all liked the blending of traditional camcorder ergonomics with the LCD screen, with Stewart referring to it as a "good hybrid of old technology and new." While Brent called it "a really enjoyable camcorder to use" and praised its "great design, useful features and solid performance," he confessed that he'd rather own the Sharp 8mm.

• **Sony CCD-SC5 Handycam Snap:** fixed-focus 4mm lens with 12mm sliding telephoto adaptor, autoexposure, auto white balance, external mic and earphone jacks, 1/8-inch video/audio output jack, three-inch LCD monitor with hood, LCD on/off switch, optical viewfinder and infrared remote.

"The ergonomics are great," Brent said, "I thoroughly enjoyed shooting with this camcorder." He added, though, that "with no control over anything, you can't expect much more than recognizable images and sound." Stewart agreed, saying that "despite some shortcomings, this is my first choice for the 'fun' camcorder of the shootout.

Not having to worry about focus is a nice change." Janeen and I weren't nearly as taken with its "video Brownie" aspects. However, Janeen noted that "the telephoto adaptor gives the Snap the feel of a My First Sony product."

Overall, the Snap was Brent's and Stewart's "guilty pleasure"—a no-frills

LCD camcorder that's extremely easy to use. "I wish this camcorder were Hi8 and waterproof," Stewart remarked, while Brent confessed, "I'm torn. I like this camcorder very much, but with its below-average picture and sound, it's difficult to recommend. For certain people, it would be perfect."

FACE-OFF FINALE

Most of our panelists agreed that the best models, overall, for everyday videographers were Sharp's VL-E36U ViewCam and Sony's CCD-FX730, with the caveat that the Sony's tape transport is loud enough to be picked up by its microphone, so an external mic should be used whenever possible.

While most panelists felt that the picture and sound quality of the Sharp VL-H400U Hi8 ViewCam were lower than expected, and that the design was uncomfortable for long-term shooting, they agreed that it possesses a number of high-end features that make it extremely useful for the serious video hobbyist.

All also agreed that the Sony Handycam Snap is, mediocre sound and picture aside, so easy to use that it's a perfect choice for people who want nothing more from their camcorder than video "happy snaps."

All four of these camcorders warrant recommendation—to distinct types of users. For a serious videographer, the Snap would be a disaster. And for casual family video, the VL-H400U would cost plenty, but deliver few real benefits. But reverse these situations—put the Snap in the hands of a casual shooter, and the VL-H400U in the camcorder bag of a moderately serious shooter—and everyone would be happy. ■



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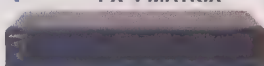
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PROJECTORS

continued from page 55

Dallas). Every year, INFOCOMM hosts a projector shootout, where manufacturers display their wares next to the competition. All use the same brand and model of screen and the same program material, and all are tweaked by the manufacturers' technicians.

MAKING THE GRADE

Much of the quality of a front-projected picture rests in the setup of the projector, so you can't make absolute judgments based on a single viewing of a single projector. (Although as the Imaging Science Foundation's Joel Silver pointed out during the shootout, "The same guys who set up the projectors here are often the ones training the dealers, so this may well represent the quality a consumer can expect.")

Still, the INFOCOMM shootout showed how much difference a good setup can make—the Sony projectors in the shootout looked far too dim, while the projectors in the Sony booth looked terrific.

That said, here's a tip sheet on some of '94's hottest projectors. It's based on this year's INFOCOMM shootout and on my experience with products reviewed in *Video Magazine*.

• **Video Grade.** For cheapskates like myself, this year's most exciting video projector is Zenith's Pro851X. At \$3,500, the Pro851X is probably the least expensive CRT front projector you can buy. Rumor has it that the Pro851X has been tweaked to solve the mild problems of its predecessor, the PV890X.

The 851X can produce pictures from five to 10 feet diagonally, and comes with a universal remote control that also operates cable boxes and VCRs. Zenith's projectors are well-established favorites of middle-income home theater nuts who want a big picture at a small price.

You can probably find experienced owners on the various online electronics forums who can suggest cool tweaks. Companies like Runco, Ampro, Image Amplification and GE have built projectors based on Zenith chassis, with tweaks and minor upgrades.

The least-expensive video-grade projector that produces a decent image is Sharp's \$2,000 XV-P10U, which is a portable, nine-pound, single-panel LCD model. The picture quality isn't amazing, but I've enjoyed watching the XV-P10U at picture sizes of from four to six feet. Fuji, Sony and Panasonic

also make small, inexpensive LCD projectors, but they're really appropriate only for presentations—the picture quality of such models is insufficient for home theater.

The best video-grade projectors cost from \$6,000 to \$9,500. We loved Sony's video-grade VPH-1000Q when we Videotested it (March '92), and its successor, the \$6,195 VPH-1001Q, looks even better. It adds an infrared remote control, an improved comb filter to help eliminate dot crawl, and a 16:9 mode for widescreen movies. Two other INFOCOMM standouts in the video-grade category are Panasonic's \$9,350 PT-B1010UF and Mitsubishi's \$7,200 VS-1202.

Vidikron's \$7,995 Crystal One ("Videotests," Sept.) was a no-show at INFOCOMM, but we like it, and we hear it's winning the hearts of many home theater fans. Although it only accepts 15.75-kilohertz signals, it uses a line interpolator, which is similar to a line doubler, to rid the picture of scan lines.

• **Data and Graphics Grades.** When I attended INFOCOMM three years ago, many of the projectors in these categories looked mediocre. But this year, both categories were much more competitive. Almost all the CRT projectors looked terrific; the differences between them were very subtle. There were only a few LCD entries, which couldn't match the contrast and detail of the CRT units.

Perhaps the most surprising recent entry in data-grade projectors is Sharp's XV-S90U, a \$9,995 LCD model. It's based on the XG-E800, a professional model introduced last year, but it's much brighter—it uses a 250-watt lamp instead of a 150-watt. The projector has a built-in line doubler, so like the Vidikron Crystal One, it produces a picture virtually free of visible pixels and scan lines. The advantage of the XV-S90U is that it will take signals from stand-alone line doublers and computers with S-VGA video cards.

I've heard some installers say that Runco's latest projector, the \$35,000 IDP 990, is one of the best video projectors ever to be available. It offers a maximum scan rate of 91 kHz, and Runco maximized clarity and light output by using nine-inch CRTs and new lenses. But for most consumers, the \$17,995 IDP900, a smaller projector with seven-inch tubes, will be more practical. I've seen the 900 and the 990 several times and have always been impressed.

I first saw Ampro's data- and graphics-grade projectors used in Cello Music & Film Systems' New York City

continued on page 98

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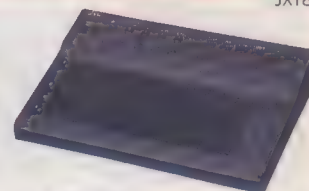
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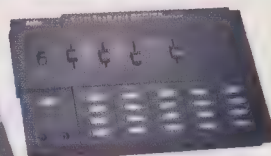
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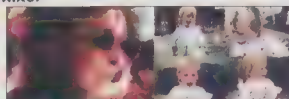
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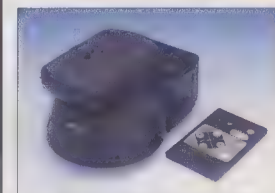
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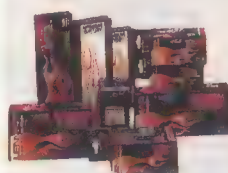


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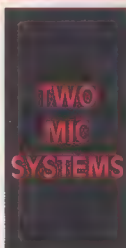
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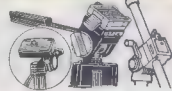
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suite, which is probably the best home theater you'll ever see and hear. Ampro's latest models, the \$23,000 3300 and the \$30,000 4300, both impressed me at INFOCOMM. The 4300 won my pick as the best picture of the show. Both handle scan rates up to 90 kHz. The difference is that the 4300's nine-inch CRTs perform slightly better than the 3300's eight-inchers.

For as long as I can remember, Sony's data- and graphics-grade projec-

tors have been considered among the best. The company's new data-grade model, the \$14,910 VPH-1252, is already finding its way into high-end custom installations. Barco has also been a long-time favorite of custom installers; both of its new graphics-grade models, the 1209 and the 808, scan up to 105 kHz.

Obviously, video projection offers lots of options. But I'd choose any of the above projectors (the inexpensive LCD

models excepted) over any direct-view or rear-projection set. Front-projection is where it's at for home theater. Here's hoping it wins the market it deserves. ■

LIGHT VALVES

continued from page 54

Instruments, which is working on a technology called digital micromirror display, or DMD. DMD uses a panel comprising hundreds of thousands of tiny aluminum mirrors, each of which is suspended by two microscopic hinges. Electrostatic force is used to twist each mirror up to 10 degrees in either of two directions to reflect or to not reflect light. Unlike CRTs, LCDs and light valves, DMD is a true digital display. The mirrors are on or off—there are no in-between settings. So how do DMDs achieve shades between black and white? By keeping the mirrors on or off for only part of the duration of each video frame.

Texas Instruments has created DMDs with pixel resolutions of up to 2,048 by 1,152, which is good enough for HDTV. But TI will only supply DMD panels to other manufacturers. When can we expect the first DMD projectors? Maybe next year. —BB

BETTER BEAST

continued from page 57

turned them into. . . dinosaurs. But their animal motion know-how was required throughout the film's production. "The stop-motion animators would interact with the CG guys, exchanging techniques and ideas," says Tippett. "We cross-pollinated a craft." Though the future of stop-motion animation is uncertain, Tippett foresees more collaborations. "It's important to bring traditional craftsmen into the computer age, because they're the ones who know how to make things look good," he says.

Muren and company had two main problems to solve as they went about creating the first all-digital dinosaur. "We had to make it look real, not like a computer image or a plastic animal," Muren says. "And we had to give it a performance and an attitude—a heart and soul." The computer graphics team was rewarded for its breakthrough with what amounted to 52 separate shots in

continued on page 108

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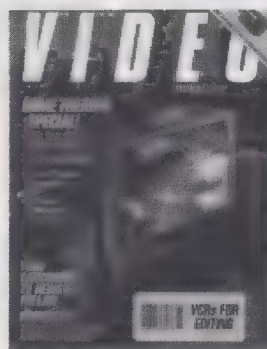
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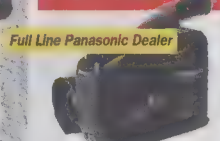
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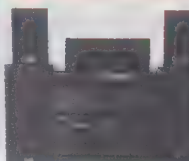


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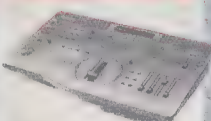
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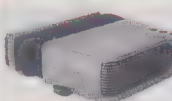


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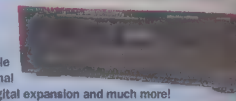
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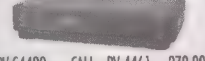
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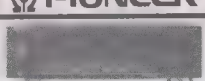
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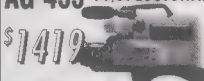
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the film. The huge brachiosaur at the beginning of the film, the remarkably realistic gallimimus "stampede" sequence and all the running shots of T. Rex, among many others, were created entirely on computer with filmed back-grounds.

The idea for the climactic dinosaur confrontation in the rotunda of the Jurassic Park visitors' center occurred to Spielberg only after he discovered what ILM was capable of doing. "Stephen changed the ending based on what he saw coming along in CG," Muren proudly explains. The realism of the computer-generated images also let the director dwell on creature shots as long as he liked, a luxury no filmmaker had ever enjoyed. "There's a shot of the brachiosaur that's 25 seconds long," Muren observes.

Meanwhile, Winston was hard at work planning the many full-sized mechanical creatures Spielberg was demanding. His most challenging task was finding a way to make his studio's 40-foot-long, 9,000-pound, sculpted T. Rex "move quickly and strongly with organic fluidity," Winston says. He created a small version of the animal and connected it to the large version through a computer interface. Puppeteers manipulated the small creature to make the larger one move. (This technology is currently on public display in the Jurassic Park exhibit at Universal Studios Hollywood.) The upper portion of the large T. Rex was mounted on a customized hydraulic flight simulator to give it strong and graceful movements.

Lantieri had to work closely with Muren and Winston to create complementary physical effects. If a car was crushed under the weight of T. Rex or a simple footprint appeared in the mud, Lantieri had to make the events look realistic "often without benefit of having the creature on the set," Lantieri explains. He also had the harrowing task of overseeing stunts—such as the car that falls 150 feet through a tree right above star Sam Neill's head—and ensuring the safety of cast and crew. "We had to treat the T. Rex on the set the way we treat a helicopter—as a danger area," says Winston. "It actually could have killed you. It was that heavy."

As proud as they are of their work on *Jurassic Park*, the four F/X artists all claim they get too much credit for it's success. "Audiences don't get that this is a director's medium," Winston says. "All the credit should go to Spielberg. We were just doing his bidding. It was his creative genius that made the movie happen." But it was also Winston, Muren, Tippett and Lantieri who ap-

peared together onstage at the Academy Awards ceremony to accept Oscars for Best Achievement in Special Effects for their work on *Jurassic Park*. ■

GOOD DECKS

continued from page 60

The VCR Plus programming system is also standard, with most makers offering cable box control through either an onboard or wired remote infrared signal "blaster." The latter is needed if your VCR and cable box are not stacked together.

Camcorder users will appreciate the random assemble editing feature on many models that lets you create videos by rearranging scenes in any order you want. For quick connections to camcorders, most S-VHS decks have front-mounted audio/video jacks. Some have S-Video and pause controls, although not all editing systems are compatible.

Some have jog/shuttle wheels on the VCR and/or the remote for user-friendly, frame-by-frame manipulation and special effects playback. RCA's VR721HF substitutes a round array of buttons on both the deck and the remote that control the same jog/shuttle operations as the more familiar wheel, but without the precision.

Taking a cue from high-end audio-cassette decks, some smart decks by Sony, Hitachi, Mitsubishi and Panasonic use adaptive circuitry that adjusts for each tape that's inserted as well as the condition of the VCR's heads. This feature is especially useful for rental tapes that have been used so often their signal strength has decreased. Before recording, Sony's SLV-R1000 and Mitsubishi's HS-U770 also taste blank tapes and adjust for differences in chemical formulations.

Other useful eccentricities in these high-end models include 30- or 60-second tape skip buttons that let you give bad commercials the bum's rush, a "retake" or "record cancel" feature that returns to the previous edit spot and, on JVC models, a family message center useful for leaving messages like "Be home at 6 p.m." ■

DIRECTORY

continued from page 76

The "overreliance on technology leads to loss of humanity" message was never delivered so entertainingly. Surround. (PG) 92 min. LD letterboxed \$34.98. MGM/UA.

When a Man Loves a Woman

1994. Andy Garcia, Meg Ryan; dir. Luis Mandoki. Three-hanky, feel-good, beautiful-alcohol-wife summer movie. For better or worse. Stereo. (R) 126 min. LD letterboxed \$39.99. Touchstone

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Noam Chomsky and the Media

1993. Bill Moyers, William F. Buckley, Jr., Tom Wolfe, Peter Jennings, Michel Foucault; dirs. Mike Achbar, Peter Wintonick. Filmic illustration of Chomsky's exploration of his theory of systematic media deception to keep us dis-informed. (NR) 167 min. Two volume set \$59.95. Zeitgeist.

DRAMA

Marianne and Juliane

1980. Barbara Sukowa, Jutta Lampe, Rudiger Volker; dir. Margarethe von Trotta. Personal and political collide in this journey down the separate paths two sisters take through the '70s—one becoming a feminist journalist, one a terrorist. Mono, subtitled. (NR) 106 min. VHS only, \$79.95. New Yorker.

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Even Cowgirls Get the Blues

1994. Uma Thurman, John Hurt, Rain Phoenix, Keanu Reeves, Lorraine Bracco; dir. Gus Van Sant. Girl born with big thumbs puts them to use hitchhiking, but wishes to overcome her "fate" and settle down with a true love. Stereo. (R) 97 min. LD letterboxed \$39.99. New Line.

Masque of the Red Death

The Raven

1963/1964. Vincent Price, Peter Lorre, Boris Karloff, Jack Nicholson; dir. Roger Corman. Poe double feature; one an intense, richly colored tale of plague and power, with the best Death since *The Seventh Seal*, the other a wonderful tacky, plotless, send-up using leftover footage. Mono. (NR) 174 min. LD letterboxed \$49.99. Orion. ■

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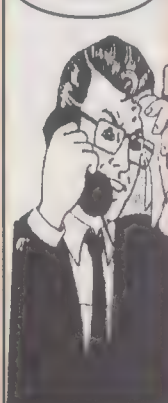
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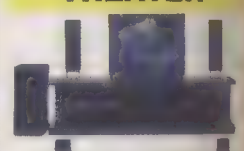
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CCD-TR4300	2749.95	CCD-FX4620	599.99
CCD-TR4400	2799.95	CCD-FX4720	599.99
CCD-TR4500	2849.95	CCD-FX4820	599.99
CCD-TR4600	2899.95	CCD-FX4920	599.99
CCD-TR4700	2949.95	CCD-FX5020	599.99
CCD-TR4800	2999.95	CCD-FX5120	599.99
CCD-TR4900	3049.95	CCD-FX5220	599.99
CCD-TR5000	3099.95	CCD-FX5320	599.99
CCD-TR5100	3149.95	CCD-FX5420	599.99
CCD-TR5200	3199.95	CCD-FX5520	599.99
CCD-TR5300	3249.95	CCD-FX5620	599.99
CCD-TR5400	3299.95	CCD-FX5720	599.99
CCD-TR5500	3349.95	CCD-FX5820	599.99
CCD-TR5600	3399.95	CCD-FX5920	599.99
CCD-TR5700	3449.95	CCD-FX6020	599.99
CCD-TR5800	3499.95	CCD-FX6120	599.99
CCD-TR5900	3549.95	CCD-FX6220	599.99
CCD-TR6000	3599.95	CCD-FX6320	599.99
CCD-TR6100	3649.95	CCD-FX6420	599.99
CCD-TR6200	3699.95	CCD-FX6520	599.99
CCD-TR6300	3749.95	CCD-FX6620	599.99
CCD-TR6400	3799.95	CCD-FX6720	599.99
CCD-TR6500	3849.95	CCD-FX6820	599.99
CCD-TR6600	3899.95	CCD-FX6920	599.99
CCD-TR6700	3949.95	CCD-FX7020	599.99
CCD-TR6800	3999.95	CCD-FX7120	599.99
CCD-TR6900	4049.95	CCD-FX7220	599.99
CCD-TR7000	4099.95	CCD-FX7320	599.99
CCD-TR7100	4149.95	CCD-FX7420	599.99
CCD-TR7200	4199.95	CCD-FX7520	599.99
CCD-TR7300	4249.95	CCD-FX7620	599.99
CCD-TR7400	4299.95	CCD-FX7720	599.99
CCD-TR7500	4349.95	CCD-FX7820	599.99
CCD-TR7600	4399.95	CCD-FX7920	599.99
CCD-TR7700	4449.95	CCD-FX8020	599.99
CCD-TR7800	4499.95	CCD-FX8120	599.99
CCD-TR7900	4549.95	CCD-FX8220	599.99
CCD-TR8000	4599.95	CCD-FX8320	599.99
CCD-TR8100	4649.95	CCD-FX8420	599.99
CCD-TR8200	4699.95	CCD-FX8520	599.99
CCD-TR8300	4749.95	CCD-FX8620	599.99
CCD-TR8400	4799.95	CCD-FX8720	599.99
CCD-TR8500	4849.95	CCD-FX8820	599.99
CCD-TR8600	4899.95	CCD-FX8920	599.99
CCD-TR8700	4949.95	CCD-FX9020	599.99
CCD-TR8800	4999.95	CCD-FX9120	599.99
CCD-TR8900	5049.95	CCD-FX9220	599.99
CCD-TR9000	5099.95	CCD-FX9320	599.99
CCD-TR9100	5149.95	CCD-FX9420	599.99
CCD-TR9200	5199.95	CCD-FX9520	599.99
CCD-TR9300	5249.95	CCD-FX9620	599.99
CCD-TR9400	5299.95	CCD-FX9720	599.99
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CCD-TR10400	5799.95	CCD-FX10720	599.99
CCD-TR10500	5849.95	CCD-FX10820	599.99
CCD-TR10600	5899.95	CCD-FX10920	599.99
CCD-TR10700	5949.95	CCD-FX11020	599.99
CCD-TR10800	5999.95	CCD-FX11120	599.99
CCD-TR10900	6049.95	CCD-FX11220	599.99
CCD-TR11000	6099.95	CCD-FX11320	599.99
CCD-TR11100	6149.95	CCD-FX11420	599.99
CCD-TR11200	6199.95	CCD-FX11520	599.99
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CCD-TR11400	6299.95	CCD-FX11720	599.99
CCD-TR11500	6349.95	CCD-FX11820	599.99
CCD-TR11600	6399.95	CCD-FX11920	599.99
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CCD-TR11900	6549.95	CCD-FX12220	599.99
CCD-TR12000	6599.95	CCD-FX12320	599.99
CCD-TR12100	6649.95	CCD-FX12420	599.99
CCD-TR12200	6699.95	CCD-FX12520	599.99
CCD-TR12300	6749.95	CCD-FX12620	599.99
CCD-TR12400	6799.95	CCD-FX12720	599.99
CCD-TR12500	6849.95	CCD-FX12820	599.99
CCD-TR12600	6899.95	CCD-FX12920	599.99
CCD-TR12700	6949.95	CCD-FX13020	599.99
CCD-TR12800	6999.95	CCD-FX13120	599.99
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CCD-TR13100	7149.95	CCD-FX13420	599.99
CCD-TR13200	7199.95	CCD-FX13520	599.99
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CCD-TR13400	7299.95	CCD-FX13720	599.99
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CCD-TR13600	7399.95	CCD-FX13920	599.99
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CCD-TR14200	7699.95	CCD-FX14520	599.99
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CCD-TR14500	7849.95	CCD-FX14820	599.99
CCD-TR14600	7899.95	CCD-FX14920	599.99
CCD-TR14700	7949.95	CCD-FX15020	599.99
CCD-TR14800	7999.95	CCD-FX15120	599.99
CCD-TR14900	8049.95	CCD-FX15220	599.99
CCD-TR15000	8099.95	CCD-FX15320	599.99
CCD-TR15100	8149.95	CCD-FX15420	599.99
CCD-TR15200	8199.95	CCD-FX15520	599.99
CCD-TR15300	8249.95	CCD-FX15620	599.99
CCD-TR15400	8299.95	CCD-FX15720	599.99
CCD-TR15500	8349.95	CCD-FX15820	599.99
CCD-TR15600	8399.95	CCD-FX15920	599.99
CCD-TR15700	8449.95	CCD-FX16020	599.99
CCD-TR15800	8499.95	CCD-FX16120	599.99
CCD-TR15900	8549.95	CCD-FX16220	599.99
CCD-TR16000	8599.95	CCD-FX16320	599.99
CCD-TR16100	8649.95	CCD-FX16420	599.99
CCD-TR16200	8699.95	CCD-FX16520	599.99
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CCD-TR16500	8849.95	CCD-FX16820	599.99
CCD-TR16600	8899.95	CCD-FX16920	599.99
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CCD-TR16800	8999.95	CCD-FX17120	599.99
CCD-TR16900	9049.95	CCD-FX17220	599.99
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CCD-TR17100	9149.95	CCD-FX17420	599.99
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CCD-TR17300	9249.95	CCD-FX17620	599.99
CCD-TR17400	9299.95	CCD-FX17720	599.99
CCD-TR17500	9349.95	CCD-FX17820	599.99
CCD-TR17600	9399.95	CCD-FX17920	599.99
CCD-TR17700	9449.95	CCD-FX18020	599.99
CCD-TR17800	9499.95	CCD-FX18120	599.99
CCD-TR17900	9549.95	CCD-FX18220	599.99
CCD-TR18000	9599.95	CCD-FX18320	599.99
CCD-TR18100	9649.95	CCD-FX18420	599.99
CCD-TR18200	9699.95	CCD-FX18520	599.99
CCD-TR18300	9749.95	CCD-FX18620	599.99
CCD-TR18400	9799.95	CCD-FX18720	599.99
CCD-TR18500	9849.95	CCD-FX18820	599.99
CCD-TR18600	9899.95	CCD-FX18920	599.99
CCD-TR18700	9949.95	CCD-FX19020	599.99
CCD-TR18800	9999.95	CCD-FX19120	599.99
CCD-TR18900	10049.95	CCD-FX19220	599.99
CCD-TR19000	10099.95	CCD-FX19320	599.99
CCD-TR19100	10149.95	CCD-FX19420	599.99
CCD-TR19200	10199.95	CCD-FX19520	599.99
CCD-TR19300	10249.95	CCD-FX19620	599.99
CCD-TR19400	10299.95	CCD-FX19720	599.99
CCD-TR19500	10349.95	CCD-FX19820	599.99
CCD-TR19600	10399.95	CCD-FX19920	599.99
CCD-TR19700	10449.95	CCD-FX20020	599.99
CCD-TR19800	10499.95	CCD-FX20120	599.99
CCD-TR19900	10549.95	CCD-FX20220	599.99
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January 1995	11/3/94	11/10/94
February 1995	11/23/94	12/1/94
March 1995	12/29/94	1/5/95
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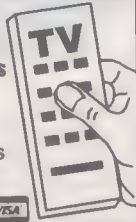
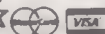
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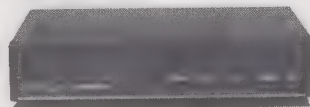
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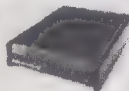


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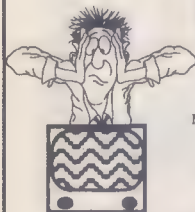
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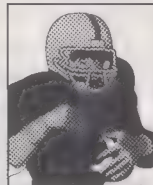
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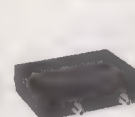
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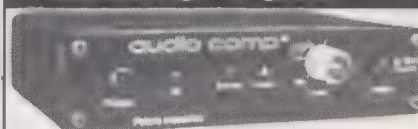
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Boxing the Falcon and other laser-ready gems

Thanks to the success of boxed sets of old movies, the selling of laserdiscs has reached a level of sophistication many observers would have once dismissed as a pipe dream. But presented in various guises, the boxed set—collections of films built around genre releases or great stars in lesser movies—is becoming a marketing necessity because just about every classic film that might sell more than a couple of thousand copies is already on disc. Besides, customers usually get a bargain—four films for the price of three is standard—and unless one of the pictures is a complete stinker, nobody seems to mind.

The challenge is to come up with good, creative packages, a challenge that is not often enough being met, leaving a lot of interesting movies to lie in the vaults for another 20 years. Here are six ideas for boxed sets that realistically could be put together for the delight of videophiles and the profits of their owners.

- **MGM/UA** reportedly has been sitting on a beautifully remastered edition of John Huston's *The Maltese Falcon* starring Humphrey Bogart and Mary Astor, trying to decide what to do with a classic that's already been issued twice in disappointing disc editions. One solution would be to box the 1941 Huston classic with two earlier versions of the Dashiell Hammett story that were shot by Warner Bros. A 1931 version, directed by Roy Del Ruth, stars Ricardo Cortez, while a 1937 version, called *Satan Met a Lady*, was directed by William Dieterle and stars Bette Davis and Warren William.

- **MCA/Universal** seems open to exploring its science fiction catalog, but only up to a point. *It Came from Outer*

Space, *Creature from the Black Lagoon* and *Revenge of the Creature* are already out in different laser packages, but the three creature features were also shot in 3-D versions, for which there is serious demand. They should be packaged together in 3-D. All were directed by Jack Arnold, so it's even more sensible.

- **MCA/Universal** has issued boxed sets devoted to Abbott and Costello and Hope and Crosby, but it hasn't

Angels—would make a great \$100 box. If this works, MCA could try pairing *Taza*, *Son of Cochise* and its letterboxed *Captain Lightfoot*, two Sirk-and-Hudson costume dramas as a double-feature follow-up.

- Studios are generally wary of releasing old genre films, but MGM/UA owns at least four first-rate B-movie mysteries: *Shadow of Doubt* with Constance Collier as a crime-solving dowager, *Eyes in the Night* and *The Hidden Eye* with Edward Arnold as a blind detective, and *Crime by Night* with Faye Emerson and Jerome Cowan (Bogart's doomed partner in *The Maltese Falcon*) as spousal sleuths. The quartet would be a perfect \$90 box on five disc sides.

- Among disc producers, only Image Entertainment seems poised to exploit the magic of the box. An upcoming set of Fred Astaire films, including the long-awaited restoration of *Top Hat*, his best picture with Ginger Rogers, is a great if obvious choice. But Image is also reportedly planning a Val Lewton box of his nine classic horror movies, including *The Ghost Ship*, which has been unavailable for 50 years. If this works, Image should also consider putting *The Falcon Takes Over* and George Sanders' three other Falcon movies

on a trio of discs. The Falcon was a freelance sleuth based on the stories of Michael Arlen. If that sells, it could follow up with two boxes based on RKO's nine Falcon movies starring Tom Conway, Sanders' brother. And if this connects with the public, Image should forge ahead with boxed sets of its seven movies, five starring Sanders and two with Louis Hayward, based on another famous rogue sleuth, the Saint, from the tales of Leslie Charteris.

Laserphiles love movies and if video companies learn to overcome their inherent timidity, they may discover a lively way of releasing forgotten gems. ■



Box Buddies.
It Came From Outer Space
and *The Maltese Falcon*.

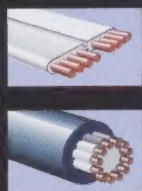
touched the work of its other '40s comedy team, Olsen and Johnson, whose madcap 1941 film *Hellzapoppin'* is one of the most requested comedies of its era. This and the team's three lesser comedies—*Crazy House*, *Ghost Catchers* and *See My Lawyer*—should be slapped together on three discs.

- **Universal** is also the repository of most of the major films of the Danish-born auteur/director Douglas Sirk, and most starred Rock Hudson. Four of them—*Written on the Wind*, *Magnificent Obsession*, *All That Heaven Allows* and a letterboxed version of *The Tarnished*



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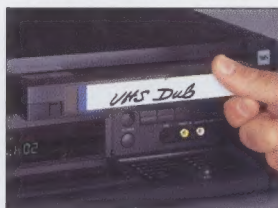
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